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Misc Works

Study Ed

TWO

MEMOIRS

ON THE

CESAREAN OPERATION.

By M. BAUDELOCQUE, Sen.

PROFESSOR OF MIDWIFERY IN THE SCHOOL OF MEDICINE OF PARIS,

&c. &c.

TRANSLATED FROM THE FRENCH;

WITH A PREFACE, NOTES, AN APPENDIX AND SIX ENGRAVINGS,

BY

JOHN HULL, M. D.

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PREFACE.

M. BACQUA, a surgeon at Nantes, having performed the cesarean operation with success upon the wife of Nicholas Gabory, on the 14th of May 1797, communicated a circumstantial account of it to the Society of Medicine at Paris. Messrs. Plessmann and Baudelocque were appointed by the Society to examine this case and to make a report upon it, which was read on the 18th of August 1798.

As a *Sequel to this Report* M. Baudelocque soon afterwards presented the first of the Memoirs, of which a translation is here laid before the public. It was read and discussed in the sittings of the 8th and 18th of September in the same year: And it was deemed of so much importance, that the Society, desirous of enabling the public at large to judge of the propriety and necessity of the cesarean operation, ordered it to be printed in the 25th No. of the work, entitled Recueil Périodique de la Société de Médicine, with a *Note* concerning the delivery of Mrs. Marville, a *Report* of the opening of her body and a *Resolution* expressive of its being the duty of practitioners to have recourse to this operation, whenever a case requiring it shall occur, and directed two hundred copies of it to be sent to the different administrative and judiciary bodies.

My attention had been for several years directed to the consideration of this important subject, when I was

first informed of the controversy, existing betwixt Mr Sacombe and his professional brethren at Paris, and that M. Baudelocque, equally celebrated as a writer, teacher and practitioner of Midwifery, had published an interesting Memoir, comprehending an account of seventy-three operations, which have occurred since the year 1750 and are consequently not included in the extensive collection, made by M. Simon and published in the *Mémoires de l'Academie Royale de Chirurgie.*

The utility of bringing a number of scattered cases into one point of view and thus affording to the reader an opportunity of perusing and comparing them with little trouble, or expence, must be obvious to every one. The necessity of this is particularly striking, when the subject is of a practical nature, is highly interesting to humanity, and has given rise to a diversity of opinion and several warm controversies amongst the practitioners of different nations, as is the case with the cesarean operation.

To determine the proportion of the successful to the unsuccessful cases of this operation, and to decide, or to enable others to decide, upon the best method of performing it, the most proper subsequent treatment of the patient &c, &c, I was induced to make a collection of all the cases of this kind, that I could meet with from the earliest period to the present time; to arrange the successful and unsuccessful operations in different tables and, whenever it was in my power, to give their dates, the names and places of abode, both of the operators and of the women operated upon, with such a detail of other circumstances as seemed likely, or necessary, to evince their respective authenticity, to direct our future practice and to enable us to determine how far the event,

when fatal, was imputable to the operation itself and its consequences, to the previous unfavourable, or hopeless, condition of the patient, or to the operation and the state of the patient combined.

Although I examined every book on the subject, to which I had access, I found myself unable to affix the dates, names &c, to several of the cases, comprised in my tables, and, as I could not, after taking a great deal of pains, procure M. Baudelocque's Memoir, which I had reason to believe would not only furnish me with the dates and other particulars, that I wanted, but also with several cases, with which I was totally unacquainted, I was under the necessity of laying my Tables before the public, less complete than I could have wished.

Whilst I regretted my inability to avail myself of the numerous cases, contained in this Memoir, I had the satisfaction to meet with an Extract from it, in the Medical and Physical Journal for June 1799, which I inserted in the first part of my *Second Letter to Mr. Simmons*. I afterwards met with a valuable Analysis of the Memoir in the Medical and Chirurgical Review for September 1799, which I have occasionally quoted and referred to in the second part of the same letter.

In the course of last month I was fortunate enough to procure the original Memoir from Hamburgh, as published separately from the *Recueil*, which I perused with great pleasure. However much I may differ in opinion from the author concerning some practical points, particularly with respect to the use of the crotchet, during the life of the child, and the advantage of inducing premature labour in cases of distortion of the pelvis, I cannot but regard his Memoir as a valuable production and I conceive, therefore, that I have been usefully employed in

giving it an english dress, adding some notes and promoting the circulation of it as far as is in my power.

The NOTES, which I have added, have a *T* affixed to them, for the sake of distinction. These are neither so numerous, nor so long, perhaps, as might be expected by some readers: For, after having so recently published my sentiments, at full length, upon almost every point, relative to the cesarean operation, I have thought it unnecessary to repeat them here and have, for the most part, contented myself with giving references to my former publications.

When the first Memoir and a few pages of the Appendix * were printed, I received eight volumes and two numbers of the *Recueil Périodique de la Société de Médecine* and, on looking over the contents of these for additional information with respect to the cesarean operation, I discovered that M. Baudelocque had presented a second Memoir upon this subject to the Society and that both these Memoirs were published in the 5th volume of the work mentioned above. The second Memoir contains five additional cases with some remarks on the after-treatment of the patient &c, and I have thought it proper to publish a translation of this as well as the former.

The APPENDIX comprehends an account of five interesting cases of difficult parturition, arising from deformity of the pelvis, with remarks; some observations on the causes and cure of *Rachitis* and *Malacosteon;* a nosological view of these two diseases; and three cases of the latter with an analysis of the urine of the patients. The consideration of these two affections of the bones,

* This has occasioned three of the pages of the Appendix to be wrong numbered, which the reader is requested to correct.

it is presumed, is not improperly introduced here, since they are the most common causes of that extreme deformity of the pelvis, which renders the operation of hysterotomy indispensably necessary.

The PLATES are added in order to give a clear idea of the discriminative characters of the different kinds of deformity, produced in the human pelvis by the two diseases above-mentioned. In my *Defence of the Cesarean Operation*, pages 193 &c, I have attempted to account for this remarkable diversity and beg leave to refer the reader to the explanation there given.

The three first plates exhibit a view of the superior aperture, a view of the inferior aperture and a lateral view, or profile, of the pelvis of Ellen Gyte, which became thus distorted in consequence of a softness of the bones, after she had born children.

The three last are mere Outlines, taken from three excellent engravings in the 4th volume of the Medical Observations and Inquiries. They exhibit three similar views of the pelvis of Martha Rhodes, which had been rendered thus deformed in her infancy, in consequence of ricketts.

The whole number of cesarean births, recorded in the *Tables*, contained in my two *Letters to Mr. Simmons* and in this publication, is two hundred and twenty-six. Of these the unsuccessful ones amount to ninety; the successful ones to one hundred and thirty-six; and, whatever objections may be raised to the authenticity of some of the latter description, published by Rousset and other early writers, I trust a sufficient number of well authenticated cases will be found amongst them to convince any reasonable and unprejudiced mind:

1st. *That the cesarean operation has in many instances saved the parent;*

2dly. *That it has generally, if not invariably, preserved the life of the child, when performed in time; and*

3dly. *That cases do occur (more frequently indeed than is commonly supposed), in which delivery by the natural passage is physically impossible and consequently, in which neither the parent, nor her offspring, can be preserved by any other means.*

MANCHESTER,
May 27, 1801.

CORRECTIONS.

Page	Line	
125.	14.	*For* see *read* sees
134.	15.	*For* Shone *read* Shore
135.	23.	*For* six *read* five
163.	15, 16.	*For* BC BD *read* BE BF
178.	4.	*For* two *read* four

FIRST MEMOIR.

RESEARCHES

AND

REFLECTIONS,

SERVING TO

ELUCIDATE THE FOLLOWING QUESTIONS:

1st. *Do cases exist, in which delivery by the natural passage is physically impossible?*

2d. *These cases being determined to exist, is the Cesarean Operation indispensably necessary?*

3d. *Is the Cesarean Operation inevitably fatal to the mother?*

THE more extraordinary an operation appears in the eyes of the public, the more important it is in its consequences and the more uncommon the occasions of performing it are, the greater is the necessity of collecting the cases of it, which are always very much dispersed in consequence of their occurring at very distant periods; whether it be our intention to prove the utility of it, or

to demonstrate its dangers; to bring it to perfection, or to occasion it to be discontinued. The more loudly the cry of prohibition is heard against this operation, the more strongly do the glory of the healing art and the welfare of humanity, which constitutes its object, call upon the learned societies to examine it, to discuss its merits, to fix the degree of confidence, to which it is entitled, and the limits, within which it ought to be circumscribed. Considered in all these points of view, no surgical operation can with more propriety engage the attention of the Society of Medicine than the cesarean section: For none interests a greater number of parts, or exposes more, of which the sound state, at all times easily disturbed, is more necessary to the support of health and life: None is practised less frequently, or is more important in its consequences; whether we consider the advantages procured by it, when successfully, or the mischief resulting from it, when unsuccessfully performed: Lastly, no operation, during the two last centuries, has had more determined adversaries, or, perhaps, more enlightened partisans.

If the cesarean section be justly regarded as the grandest and the most dangerous operation

of surgery, it must also appear much more important in its object than any other, since by exposing the life of a single individual to danger, it may preserve two and sometimes three lives.

In collecting the observation of Mr. Bacqua (1) and all of a similar kind, the Society of Medicine has it less in view to offer to professional men new proofs of the advantages, derivable from the cesarean operation, than to furnish them with an opportunity of examining the facts, contained in these observations, of comparing them with one another and with those already published, even in the cases, wherein it has not been successful, in order to determine, what ought to be done to secure greater success hereafter, from what has been hitherto done to obtain it, and from what has probably been neglected in the unsuccessful cases. By publishing these new observations, the Society will occasion new light to be thrown upon the subject; its correspondents will be eager to communicate their reflections; facts, hitherto unknown, will be transmitted to it, and it will incorporate them with the mass of

(1) See No. XXIV. of this *Recueil.*

cases, which it is easy to collect at this time. If they be not all as consoling as those, of which we gave an account in one of the last sittings, the Society will be able to render them useful, by making them concur to the same end, that of fixing the opinion, which ought to be held concerning the cesarean operation. The Society may, in this respect, at the beginning of its brilliant career give it that sanction, which the Academy of Surgery would not have failed to have done in terminating its career, if it could have foreseen its approaching dissolution. It was long expected, that this celebrated Academy would pronounce its determination concerning the cesarean section; that it would fix the limits; that it would point out the best method of performing the operation, and assign both to it and to the section of the symphysis pubis their proper rank, provided both were retained. This remains ſtill to be done; a great number of materials awaits the hand, which is to arrange them; a still greater number, perhaps, is wanting; but the Society will obtain them, by directing its attention to this object, and each of its members will be eager to furnish what is in his power. The cesarean operation is once more become the subject of

a great controversy; it is the entrenchment, behind which are concealed the enemies of those spirited and enlightened men, who have dared to undertake it, and who, disregarding the poisoned darts, incessantly thrown against them, will, doubtless, continue to perform it, if they meet with new cases, wherein it is absolutely necessary. But timid practitioners, not daring to resist these attacks, will commit great faults, and deliver up to death the mothers and infants, which they could have preserved, as might appear from recent examples, if the able men, who compose the Society of Medicine, do not admit and establish the principle of the necessity of this operation. May the reflections, that I am going to lay before the Society, enlighten it upon the subject of its true glory and the interests of humanity, in defence of which its lucubrations and talents are employed!

No one can at this period be ignorant of the advantages derivable from the operation, of which I am treating, or of the dangers that appear inseparably connected with it. More than a hundred and fifty observations, collected since the time of Rousset, no longer permit us to doubt of its uses, or dangers; to detract from the former, or exaggerate the

latter. The dangers, attending this operation, ought not to appear greater at this period than those, which would result from its prohibition, except in the eyes of the ignorant, or prejudiced. The well informed practitioner will find real advantages in it, even in those cases that others would adduce with the view of causing it to be rejected. The operation has not always been crowned with success; in most cases, it must be confessed, however distressing this truth may be, that the mother has not recovered. But in these very cases, what would have been her fate, if the operation had not been performed? Would her death, which in that case was inevitable, have been more easy, or less cruel? And what would have been the lot of the child, which is constantly saved by this operation, when practised in time, that is, before its death? Both parent and offspring would invariably have fallen victims: for by what other means could nature, or art have succoured them? Can the mother resist for any long time the painful and unavailing efforts, made for the expulsion of the infant? And can the infant support these with less danger? How often has the child been destroyed in a less

painful struggle and under efforts, less violent than those, which are fruitlessly exerted to overcome the obstacles, requiring the cesarean operation? Its death then is certain and that of the woman not less so (2): The testimony of accoucheurs is unanimous upon this point. In vain do some men, doubtless, unacquainted with the art, maintain the contrary; in vain do they quote some instances to disprove this assertion, to shew that the pains of labour will cease sooner, or later, in the females under consideration, that nature will employ other means and other ways to free them from their burden; in vain do they contend, that in some the putrefaction, that takes place in the child after death, and of which the progress is sometimes very rapid, will dispose its head to be moulded to the form of that canal, which at first had denied it a passage; or that its limbs, detached by this destructive agent, will be separately expelled; that in others the inflamed uterus will ulcerate and transmit the infant, either entire, or in pieces, by means of abscesses, as has been remarked in the sequel of extrauterine conceptions and, perhaps, in some of those cases, where

(2) See the *Note* placed at the end of these Researches.

the faulty conformation of the pelvis renders the cesarean operation necessary. But what can a few examples avail against some thousands of others, which writers have not deigned to collect, or have been interested in consigning to oblivion, and which would have evinced the uncertainty of such resources and the folly of depending upon these extraordinary efforts, so destructive in themselves! It is not upon exceptions, upon isolated facts, that Medicine founds its precepts, but upon what observation shews to be the most constantly occurring.

In teaching us, that nothing ought to be expected from these efforts in cases, where delivery by the natural passage is impossible, observation likewise informs us, that in many of these cases art offers no other resource than the cesarean operation and that all the means, which practitioners have wished to substitute in its place, have been attended with equal inconveniences, without affording the same advantages.

The necessity of this operation is no longer a problem; it cannot, at the present day, appear doubtful to any person but those, who are interested in combatting it, no matter from what motive. It is as fully established

as the necessity of lithotomy, against which no one will dare to object; because it is on some occasions as impossible to extract a child by the natural passage, as to bring a large stone from the bladder through the channel of the urethra. The cesarean operation has this peculiarity, that it is always urgent, whilst the operation for the stone is scarcely ever so; that the least delay may render it useless to the child and more dangerous to the mother, whilst the other may, perhaps, be deferred without any material inconveniences.

To make this principle generally known, and to force even the opponents of the cesarean operation to admit it as well as the numerous class of persons, who have not devoted much time to the study of our art, it is necessary to prove, in the first place, the existence of cases, wherein delivery by the natural passage is impossible, and afterwards the insufficiency of all the other means for accomplishing it. This is a very extensive task; it ought to form the subject of several long memoirs, for which we have already collected a great quantity of materials: Time alone has been wanting to arrange them properly, and submit them to the judgment of the learned men, who culti-

vate Medicine, and especially that branch of it, more immediately interested in the subject of these memoirs.

The authors, who have written upon the cesarean operation, since the time of Rousset to the present day, have supposed it to be necessary: 1st. in the case of extrauterine gestation; 2dly. where the fœtus has escaped entirely into the cavity of the abdomen, on account of a rupture of the uterus; 3dly. in the case of a hysterocele, or hernia of the uterus, similar to that described by Sennert; 4thly. where tumours, bridles, cicatrices, adhesions, or other affections of the soft parts, included in the pelvis, obstruct this bony canal, the neck of the womb, or the vagina. Lastly, when the pelvis is in itself so far defective, that there no longer exists, betwixt its dimensions and those of the head of the fœtus, the relation necessary to delivery (1).

First Case. The existence of an extrauterine conception, of any kind whatever, cannot be admitted, without acknowledging the absolute impossibility of delivery by the natural passage, the infant being alive and entire: No truth has less need of proofs.

(1) See Second Letter to Simmons, p. 160—174. T.

But the necessity of the cesarean operation will not appear to be an inevitable consequence of this principle. In order to admit the necessity of this operation, it ought to be demonstrated, that there is more advantage in performing it, or less risk incurred by the woman, than in leaving her and her child to the efforts of nature, as has been usually done to this very time. The consideration of this point will make the subject of one of the memoirs announced above.

Second Case. The impossibility of bringing a fœtus through the womb, in order to extract it by the natural passage, when it has escaped entirely into the cavity of the abdomen in consequence of a rupture of this viscus, is as fully demonstrated as that of delivering the woman, in any other manner than by the cesarean operation, of a child that has been developped in one of the ovaries, or fallopian trumpets: And this operation is much more clearly indicated in this case, because the time of performing it is better known; because it cannot be attended with such inconveniences here, as in the case of extrauterine gestation, and because with the almost general assent of authors it has already been attended with success.

Third Case. If the instances of inguinal and femoral herniæ of the uterus be rare, a single case is sufficient to establish the possibility of them, whatever difficulty may be experienced in explaining their mechanism. The fact, related by Sennert, and that mentioned by Ruisch, are well known. But these cases do not appear to be of the same species: In that of Sennert, as the impregnated womb could not be reduced in the ninth month of gestation, the cesarean operation was of necessity had recourse to: In that of Ruisch, a midwife turned the child and extracted it by the natural passage. This last case bears a perfect resemblance to what we have several times observed in consequence of great obliquities of the womb, taking place anteriorly in women, who had a considerable opening in the linea alba and in whom this viscus was covered and supported by the common integuments only; whereas we must admit that of Sennert to have been a true inguinal hysterocele; an instance of which was presented to the School of Medicine, in the month of Pluviose of the 4th year of the Republic, by our colleague Lallement, chief surgeon of the Salpêtrière. The womb had passed completely through the

right inguinal ring, and formed a tumour in the fold of the groin and the top of the thigh; it was sound, and nearly of the natural size. On inspection of the part every one was forced to acknowledge, that the delivery of this woman would have been impossible, by any other means than the cesarean operation, if she had been impregnated during the existence of this hernia; which was of long standing and irreducible, notwithstanding the uterus was empty and of small size. Here then are several cases, wherein the necessity of this operation is founded on the physical impossibility of the expulsion of the infant by the natural passage, and on the insufficiency of all other means of accomplishing delivery. Which of the known methods can become applicable in these cases? Is it by means of the forceps, of crotchets, or of the section of the symphysis pubis, that any one will propose to effect the delivery? It is evident, that none of these resources will avail. The limits of the art do not appear to be equally circumscribed in those cases, where the obstacle to delivery proceeds from male-conformation of the pelvis, or from some unnatural affections of the soft parts, included in this bony canal. On the one hand, it has

been believed, that the fœtus might be prevented from attaining a large size, by limiting its increase during pregnancy, as its bulk may be diminished in the time of labour; and on the other hand, it has been supposed to be as easy to enlarge the pelvis of the woman, as to make an incision in the neck of the uterus, when obstructed, hard and scirrhous; as to cut through the bridles and cicatrices, contracting the vagina; as to destroy the adhesions of the sides of this canal and dilate it; as to remove tumours, affecting its parietes, or seated in the cellular texture, which envelops it and connects it with the surrounding parts. We shall only take a cursory view of those affections of the soft parts, which appear capable of opposing great obstacles to delivery, in order that we may afterwards pay more attention to the faulty conformation of the pelvis, which seems to belong more to our subject.

Fourth Case. It is evident, that the greater number of the affections of the soft parts does not require the cesarean operation; because the canal, destined for the passage of the child, may be rendered pervious by incisions, or suitable dilatations. But we are not to hope, that we shall be able to destroy with

equal facility and success the hard scirrhous tumours, which have their seat in the cellular texture of the vagina; which are closely connected with the bladder, or rectum, and with the neck of the womb; which have a very broad base; which are contiguous to, or surround the hypogastric vessels and nerves. A practitioner might be deemed equally ignorant and rash, who would undertake to remove entirely, or in part, these kinds of tumours. If authors have perceived only the possibility of meeting with such affections in the time of labour, and have mentioned them only that they might not omit any of the causes, requiring the cesarean operation, we are fully convinced, that there may exist such as leave no other resource than this operation. We could make known an interesting example of this kind, if our colleague Coutouly, who has better pretensions for presenting it to the Society, had it not in view to do this: It is the case of ——— Desnos, in Saint-Denis-Street. This woman, perhaps from her early infancy, or for a long time before her marriage, was troubled with a hard scirrhous tumour, of which the base was intimately connected with both of the ossa pubis, with the lower part of the right os ilium and the

os ischium, and occupied about two thirds of the internal surface of the pelvis. It obstructed the pelvis so much in her first labour, that it appeared on a first examination to be the head of the child. But the error was soon perceived, and the accoucheur called in two of his brethren, viz. Coutouly and me. The cesarean operation would then have appeared to us to be indicated, if we could have divested ourselves of the idea of its dangers, and had not been aware of the little hope of preserving the child after a labour of more than thirty hours. We resolved therefore to try other means. As the hand could be passed through the pelvis, though not without great difficulty, we believed it to be preferable to turn the child and extract it by the feet, having recourse to opening the chest and head, if they could not be brought down without it: But this project could not be executed; it was impossible to introduce the hand for the second foot, or to bring down the trunk by pulling at that foot, which had been with great difficulty laid hold of and disengaged; it was therefore necessary to give up this attempt and to open the head, evacuate the brain, and pull away the bones, an operation which required hard labour for five hours: An ex-

tensive practice had never presented any thing so difficult to us before, or such alarming consequences of delivery without proving mortal. The patient owed her preservation to the indefatigable attention of her accoucheur.

The tumour, having become enlarged and harder during the two whole years, which intervened betwixt this and her second labour, did not allow the same means to be employed again for effecting her delivery. Besides, ——— Desnos would never have consented to the mutilation of this second child, if the accoucheurs should have seen the possibility of it: She knew to what danger the sacrifice of the first infant had exposed her; she was desirous of preserving the one, which she now carried in her womb, and her family had known during two years, that nothing but the cesarean operation could accomplish this. She submitted to it and only enjoyed the happiness of being a mother during five days, the operation only proving successful for the infant, which was healthy and larger than the common size.

The tumour was found, on opening the body, to be *three* inches *five* lines high; *two* inches ten *lines* thick, in the direction from

pubes to sacrum, and *three* inches *three* lines from one side of the pelvis to the other. The pelvis was *three* inches *three* lines in diameter, from the symphysis pubis to the os sacrum, and *four* inches *seven* lines transversely. Consequently one of the dimensions of this pelvis exceeded that of the scirrhous mass by *five* lines only, and the other by *one* inch and *four* lines. This tumour being very hard, like all of the same nature, the pelvis of Desnos, considered relatively to delivery, will appear to have been infinitely more contracted than the generality of those, of which the faulty conformation has seemed to require the cesarean operation.

Fifth Case. A knowledge of the excess of the diameters of the head of the fœtus over those of the pelvis of the woman is not sufficient, in every case, to satisfy us, that the birth of a living child and at the full time will be impossible by the natural passage: To judge with certainty concerning this matter, we ought to know also the changes, which these dimensions may undergo in the course of the labour. Delivery *per vaginam* would never become impossible, if the defective pelvis could constantly be enlarged to the necessary extent, or if the head

of the fœtus could be so far compressed, that its diameters should be smaller than those of this bony canal; or if this relation could be constantly obtained by the enlargement of the pelvis and the diminution of the head taken jointly. In order to decide whether delivery, in the case under consideration, be physically impossible, it is necessary to know, 1st. what is the relation, existing between the dimensions of the distorted pelvis and those of the fetal head; 2dly. how much the last may be diminished by the pains of labour, and how far the first may be augmented, which cannot be determined with exactness. Some data, however, well established by observation, will be found sufficient for our purpose, and we cannot err in taking them as rules.

If women labour for the most part without very great difficulty, it is because the dimensions of the pelvis exceed, in some degree, those of the head of the child; because the head experiences but little friction in its passage through this canal, and because the soft parts yield easily to the agents, which tend to dilate them. This proportion not taking place in all women, they cannot all enjoy the advan-

tages of the majority. In some the bulk of the fetal head is greater than usual and exceeds the natural dimensions of the pelvis; in others this bony canal has not the dimensions, necessary for the passage of a head of the ordinary size; and in all these delivery is impossible, unless the dimensions of the pelvis be increased, or those of the head diminished, till the relation, mentioned above, takes place.

It is sufficiently proved, that the dimensions of the pelvis cannot be much augmented without the destruction of one, or more, of the symphyses, and the alteration of all of them; in other cases this augmentation is so small, that we may doubt its existence. A separation of more than six lines betwixt the ossa pubis (which scarcely ever happens) is requisite to add one line to the diameter of the superior aperture, taken from the top of the symphysis pubis to the sacro-vertebral angle. Repeated experiments have sufficiently shewn this truth, to place it beyond dispute; and equally numerous observations have excited such fears for the consequences of a more extensive separation, that we should never more attempt to obtain it.

Since the pelvis cannot be in the least enlarged in the generality of women, and a line at most in some only, and since a greater enlargement can only be the result of an operation, which is no longer admitted except by a very small number of practitioners, almost all our expectation is to be derived from the reduction of the head of the fœtus: But this reduction, as well as the augmentation of the pelvis, has its limits, beyond which it cannot go without being as fatal to the child as the separation of the symphyses of the pelvis is to the mother. Moreover, although nature should make both these resources contribute to delivery at the same time, she could not establish in all women the relation of dimensions necessary to the end, to which her efforts are directed, and there would still be cases, wherein delivery per vaginam could not be effected.

The reduction of the bulk of the fetal head is effected in two ways: In some infants the cranium only changes its form, becoming elongated from the fore to the hind head, and compressed from one bossa parietalis to the other; it thus gains in one direction, what it loses in another, and whatever may be the extent of these changes, the

cavity, enclosing the brain, is scarcely at all diminished. We have seen several of these children born alive, although they had experienced similar changes in passing through the contracted pelvis of the mother: In some the head presented only *two* inches and *six* or *eight* lines in thickness, whilst it was *five* inches in length from the forehead to the occiput, *six* inches, or *six* inches and a *half*, or even more, from the point of the chin to the posterior extremity of the sagittal suture: In others it had lost some lines less in the first direction, and had gained a little less in its length: In all, having regained its natural form on the day after the birth, it measured more than *three* inches and a *quarter* in thickness and less than *four* inches and a *quarter* in length from before to behind. Will it be proper to conclude from these rare and uncommon observations, that these same heads would have undergone greater changes, with as few inconveniences, if they had had to pass through a pelvis more deformed and more contracted? Surely, no one will draw such a conclusion from them.

If under our own eyes the heads of some children, after a painful and long labour, have been able to pass through a pelvis, so

contracted as only to measure *two* inches and a *half* in the small diameter of the superior aperture, and those of several other children, through a pelvis measuring *two* inches and *three quarters* ; in a much greater number of instances the head has not been able to mould itself to the canal of a pelvis, which was leſs contracted, and in none has it passed through a pelvis, of which the small diameter was under *two* inches and a *half*, though the pains have been equally strong and have continued for a still longer time. Hence it appears that the changes, which the head of the fœtus can experience, depend on certain conditions, that are very rarely met with at the full term of uterogestation. In the small number of children, which we have seen born under the circumstances mentioned above, the head was soft and flexible ; ossification was little advanced ; the sutures were lax and the fontanelles broad. It cannot undergo the same change of form, when it is of the solidity, usual at the end of the ninth month. If it be reduced some lines in its thickness, this is owing to one of the parietal bones passing over the other; and this reduction cannot go very far without detaching the pericranium and dura mater from the bones.

At the same time, that the parietal bones ride over one another by their upper margin, they also advance over the occipital and frontal bones, which appear to be sunk beneath them, so that the cranium is diminished both in its length and thickness at the same time. If the diameter of the skull still exceed that of the pelvis, as the bones cannot be forced to project further over one another, one of the parietal bones is fractured and depressed, or, which is infinitely more uncommon, it is depressed without being fractured; and then new disorders are added to those of the obstruction of the brain and the detachment of the pericranium and dura mater, and the child dies in the womb of its mother. All these derangements have been detected by an anatomical inspection of the children.

The following considerations are much more important and conclusive. That the head of the fœtus may be moulded in this manner to the contracted canal, through which it has to pass, it must enter and advance like a wedge; which supposes this canal to possess a width, that is not met with in all deformed pelves. Hitherto no well authenticated observation has demonstrated the possibility of delivery, where the pelvis

measures less than *two* inches and a *half* in its small diameter, and thousands of facts, if one had time to collect them, would attest that it takes place only very rarely in women, whose pelves are only *two* inches and a *half*, or even *two* inches and *three quarters* in the diameter specified above: Those, who have preserved their children in this degree of faulty conformation, being indebted for it to the imperfect state of their heads, to the flexibility of the bones, and the laxity of the sutures, as we have already remarked. Whence reasonable men will conclude with us, that the birth of a child at the full time, of the usual size and alive, is generally impossible, when the diameter of the pelvis is only *two* inches and a *half*. Besides, as a woman, who has once been delivered under such circumstances, because the head of the fœtus was soft and flexible, may not again enjoy this advantage, whatever be the number of her labours; so another woman, after several very laborious deliveries, in which it has been found necessary to mutilate the children, may afterwards labour once or twice, with less pain and more advantage.

The extent of the changes, which the cranium of the fœtus can undergo both in its

form and dimensions, being sufficiently known from these general *data*, and likewise that of the augmentation, which the circle of the deformed pelvis can admit; it is impossible not to allow, that there are cases, wherein the delivery cannot be accomplished, notwithstanding these advantages, which are often more specious than solid; since there are some, in which the dimensions of the head much exceed those of the pelvis of the woman, whatever be the increase produced in the latter, or the diminution produced in the former. If a proof of this assertion be required, we shall not need to look for it in the greatest degrees of deformity of the pelvis; for a moderately deformed pelvis will afford an ample proof. If it be admitted, that the head of a child at the full time, and of the usual size and firmness, cannot pass through a pelvis of *two* inches and a *half*, is it not more than sufficiently proved, that the head will meet with much greater obstacles from one, which is only *two* inches, and that every exception then to the general law will be impossible: for, whatever be the state of imperfection of the bones and sutures of the cranium, the head cannot enter into a pelvis of these dimensions, be moulded to it and

pass through it. To reject this truth, or to be ignorant of it, is to suppose that there does not exist any of these very distorted and contracted pelves and that those, which are preserved in some collections, have been altered or deformed, to their liking, by practitioners, after their removal from the bodies to which they belonged; a supposition so extraordinary, that it would be an offence against reason to take up any time in combatting it?

From the largest and most regularly formed pelvis to the narrowest and most distorted we observe a variety well worthy of the attention of the philosopher. There are some deformed pelves in our possession, that measure from $3\frac{1}{4}$ inches to only 14 or 15 lines and even less, in their small diameter: In the pelvis of a very distorted female skeleton, the distance betwixt the bottom of the right acetabulum and the sacro-vertebral angle is only three or four lines. Similar ones, undoubtedly, are preserved also in the cabinets of some of our brethren: The rich Museum of Dr. Hunter contained several from $6\frac{1}{2}$, or 7 lines, to 21 lines in diameter. We recollect also, that the celebrated Camper informed the secretary of the Academy of Sur-

gery in 1778, that the cesarean operation had been performed upon a woman, whose pelvis, on opening her body, measured only a Holland inch (about eleven French lines) in diameter. If the history of the cesarean operation and that of the section of the symphysis pubis do not present any examples of pelves so deformed and contracted amongst us, we find several, where the small diameter of the superior aperture was only one inch and seven or eight lines, two inches, and two inches and a half.

Hitherto we have only considered the faulty conformation of the *superior* strait, or aperture of the pelvis: But the *inferior* strait may present equal irregularities in its circumference and dimensions, although these occur much less frequently. If the bad conformation of one aperture can oppose very great obstacles to delivery, still greater must necessarily exist, when the pelvis is ill formed in every part at the same time (1).

If it be certain from these reflections, which are founded on actual observation,

(1) This observation will be confirmed and illustrated in a very striking manner by the case of Ellen Gyte, given in the Appendix. T.

that no infant, at the full time and of the usual size, can be born naturally, when the small diameter of the pelvis is not equal to two inches and a half, how many cases must appear to belong to the department of Operative Midwifery? And how much more numerous will they appear, if we recollect, that there are only few women, who can be delivered without assistance, although this diameter be two inches and a half, or three inches within a quarter, and that there are scarcely any instances of this in authors? Solayres mentioned a woman in his lectures, whose pelvis he estimated to be only two inches and a half in its small diameter, and who was very fortunately delivered of her first child. We have known a woman, in whom the same diameter appeared to have only this dimension, and a second, in whom it was two inches and eight or nine lines. —— Rouillé, who died of the consequences of the section of the symphysis pubis in 1785, was delivered once out of four times with the same advantage, although her pelvis, in the small diameter, measured only two inches six lines. Our colleague Chaussier informed the Academy of Surgery, by letter in 1778, that a woman at Dijon, whose pelvis mea-

sured only two inches nine lines from pubes to sacrum, had born three children alive out of six. Several other women, equally distorted, doubtlefs, may have had the same good fortune; but the number will appear very small, when compared with that of the women, whose children it has been necessary to mutilate, in order to accomplish their delivery, where the pelvis has been contracted in the same degree. —— Rouillé, mentioned above, has only been able to bring one alive into the world out of four; —— Dubelloy, upon whom the section of the symphysis pubis was also performed, only one out of ten; —— Huguet, who underwent the same operation, one out of three; and another woman, operated upon at Wurtzbourg by Siebold, lost seven, although her pelvis was two inches nine lines in diameter: Three children had been mutilated also in the woman, upon whom Vermond performed the cesarean operation with success in 1767; another female, operated upon by Millot in 1774, has only been able to preserve one out of six since that operation: The woman, who is the subject of M. Bacqua's observation, had to regret the loss of three children, when she submitted to the cesarean opera-

tion; and many others of these tender victims had been treated in the same way, with the view of preserving the lives of their mothers, before practitioners dared to practise the cesarean section, with the intention of saving them also.

Although it be fully demonstrated, that a woman cannot be delivered naturally and of a living child, when the small diameter is not more than two inches and a half, the absolute impossibility of delivery will not appear to be an inevitable consequence, since there still remains some hope of effecting it, either by turning the child, or extracting it with instruments. But well informed practitioners, who will examine these different methods, will soon perceive their difficulties, dangers and insufficiency even in the majority of cases under consideration. A single living infant has not been extracted through a pelvis of only two inches and a half in diameter, either by bringing it by the feet, or by means of the forceps, although some accoucheurs contend that they have met with success in this way. In pursuing the first of these two methods, the practitioner has often been obliged to crush the skull of the fœtus, to open it, to pull it away in pieces with the

crotchet, or he has torn away the trunk and separated it from the head, which has remained above the superior aperture and has occasioned much greater difficulties in the extraction. The application of the forceps cannot procure any greater advantages. If it be possible to lay hold of the head by means of this instrument, we cannot extract it, and after many efforts, equally dangerous and unavailing, we are obliged to have recourse to other means. Since there is so much danger, both to the mother and child, in attempting to deliver by either of these methods, when the diameter of the pelvis is equal to two inches and a half, it would shew ignorance and want of skill to have recourse to them, when the diameter is still smaller: The crotchet alone can then appear to be deserving of recommendation, and it ceases to be so, in its turn, when the deformity is in the greatest degrees. In fact, regarding as nothing the loss of the child, which is sacrificed in the most cruel and most painful manner, how much have we not to fear for the woman, from the use of this instrument, introduced very high, without guide, and, as it were, by chance? Can we be certain of fixing the point of it con-

stantly in the head of the child, and, when it slips, of keeping it from injuring those parts of the mother, that line the pelvis and envelop the head so closely? Can we be certain, that by mutilating the infant we shall save the woman? It would not be difficult to prove, that many more women have died in consequence of the use of the crotchet than of the cesarean operation, if practitioners had formed a collection of all those cases, wherein they have delivered, or attempted to deliver, by means of crotchets, as has been done with respect to the women, who have undergone the cesarean section. We have constantly observed contusions and lacerations of the womb, bladder, vagina, rectum and other neighbouring parts, on opening the bodies of those females, who have died after such a delivery, even where the case appeared more favourable to the application of the crotchet, since the pelvis was more than two inches in diameter. Very few women, doubtless, would consent to have their children mutilated, if they knew all the dangers, to which they would themselves be exposed by this painful sacrifice.

If even the thought of using destructive instruments upon a living child, in order to

preserve the mother, be afflicting to the professional man, who is acquainted with all the dignity of his office, how much must it distress him to repeat every year the same sacrifice in favour of the same woman and sometimes in favour of several women, when he practises in a large city, like Paris, and has acquired so much celebrity as to be called upon in the most difficult cases ? If the last resources, which we have to examine here, were as destructive to the mother as crotchets are to the child, marriage ought to be prohibited by wise laws to women, so far deformed as to be unable to bear a living child. These laws would spare the virtuous man the pain of finding himself constrained sometimes to commit a sort of crime, greater it is true against nature than society, solely because he exercises a beneficent and consoling profession. So far from prohibiting the cesarean operation, other laws should oblige us to perform it, if we can demonstrate, that this operation is the only one, which can preserve the child without being essentially fatal to the mother.

The death of the child is the only circumstance, which can authorise the use of the crotchet and other instruments of this kind:

But how can any certainty of this be acquired, whilst it remains in the womb and the finger can scarcely touch a single point of its surface, since it is sometimes difficult to obtain this certainty in a new born child, though exposed to our view and capable of being examined every where by the touch? When its death is recent and putrefaction has not taken place, we should always be afraid of being deceived. How often, after ſtrong appearances of the death of the child, have we heard its moans, when just torn from the womb of the mother by a barbarous practice, at most excusable only in the first ages of the art? How often have we seen the scattered and palpitating limbs accuse this then destructive art, or the practiser of it, of a wicked attempt, which is so much the more shocking as none of the laws, that protect innocence, can puniſh it? Admitting, that it is easy to acquire a certainty of the death of the fœtus and consequently, that the instruments, of which we are treating, will have to act only upon a dead body, it is painful to recollect, that we may still meet with cases, wherein it will be necessary to have recourse to other means, notwithstanding this perfect conviction; those, for example, where the diameter

of the pelvis does not exceed six, twelve, eighteen, or even twenty lines: for it is easily proved, that crotchets are then inapplicable. Will it be proposed in these cases, as has been done in others, which are less difficult, to restrain the growth of the fœtus by making the woman observe a strict regimen during her pregnancy; by subjecting her to a rigorous diet and only allowing her a quantity of food, barely sufficient for the support of her life? Or will it be proposed to bring on premature labour? The first of these proposals cannot possibly meet with a favourable reception from well informed persons; besides, few of those women, who are most commonly affected with these extensive degrees of distortion, which seem to preclude every other means of delivery except the cesarean operation, would be able to submit to a regimen of this kind, being almost all of them in indigence and obliged to work for subsistence. Moreover, what a number of instances might be opposed to the opinion of those, who believe that the growth of the fœtus, which is always independent of the manner of living of the mother and of the quantity as well as quality of her food, may be limited by these means!

The idea of exciting labour before the usual time will meet, perhaps, with more advocates, although it may not be more fortunate in its results. Some accoucheurs will receive it favourably, because it will appear to them to be the consequence of observation. But with a little reflection, they will easily perceive the slight identity, that there is betwixt the cases, of which we are treating, and those, where a premature delivery has fulfilled the wishes of a family, long in expectation of a living child; a circumstance not to have been expected from a delivery at the full period of utero-gestation. Because many women have been by chance delivered once, at the end of eight or even of seven months, of a living child, who could not be delivered in their preceding labours, at the full time, without using extraordinary means as the forceps or crotchet for example, will it follow that females, whose pelvis is very much contracted, will be equally fortunate? A woman, who had experienced the misfortune of having her first three children mutilated, rejoiced a while over a fall, which had induced premature labour in the eighth month of her fourth pregnancy, hoping that her child would be preserved; but her labour

was long and the child was dead born. Another woman, who had undergone the cesarean operation with success in 1774, laboured several times at the term of seven months and always in a most laborious way, although her children were very small and weighed only two pounds and a half: And none of them lived more than 36 or 48 hours(1). If this last woman has constantly been obliged to suffer very strong pains, during 15 or 16 hours, for the expulsion of so small a child through a pelvis two inches and a half in diameter; if similar pains have proved unavailing in the former woman, although the diameter of her pelvis was three lines more, what can be expected from a longer labour in cases, where the pelves are only one inch, one inch and a half, or even two inches in diameter? We think it useless to multiply facts of this kind, in order to prove that under many circumstances the delivery would not be more certain by the natural passage in the eighth, or even in the seventh month than at the full time. Will any one induce labour at a still earlier period?

(1) This woman has also had two others at the full time, which it was necessary to mutilate.

As well might we wait for the maturity of the child, to mutilate it then, if the pelvis be sufficiently large to permit this to be done. If our laws punish with death the mother, who destroys her child and the person also, who excites labour by violent means, with the intention of concealing a more advanced pregnancy from the knowledge of the public, will they allow these criminal resources, with the view of superseding the necessity of the cesarean operation? Submitting these reflections to the judgment of enlightened moralists and legislators we conclude, that there are cases, where nothing can be hoped for from delivery before the time, since there are some, where the pelvis measures only six lines and a half, or seven lines in diameter (1).

(1) In my *Second Letter to Simmons*, page 970, I have shewn, that the necessity of the Cesarean Operation may in some, but not in all, cases be superseded by inducing premature labour: And in p. 449, &c. I have considered the propriety of this practice, in the inferior degrees of deformity of the pelvis, requiring the use of the crotchet, together with the safety of it to the parent and the advantages, derivable from it to the offspring. To that work, therefore, I beg leave to refer the reader and shall in this place confine myself to a few observations on a Paper,

The section of the symphysis pubis, it was thought, would banish for ever the use of crotchets, of perforators and other deſtructive inſtruments, as well as premature delivery and

since published by Mr. John Barlow of Bolton, in the 8th Volume of *Medical Facts and Observations.*

In this Paper the ingenious Author has favoured the world with an account of the result of his extensive practice in inducing premature labour, in cases of distorted pelvis: From which it appears, that he has had recourse to this method of delivery sixteen times in five women, all of whom had been previously delivered once, or oftener, by the crotchet, and that premature labour occurred spontaneously once in two of this number. All the women recovered, a circumstance, which adds a further confirmation to the opinion, that the life of the parent is exposed to very little danger in this way. Of the children, thus brought into the world, six were dead and twelve were born alive; of which some died soon after birth; one lived ten months and five were living at the time this account was published. The number of lives, thus preserved, affords a satisfactory view of the success, to be expected from this mode of delivery to the infant. It must be acknowledged, however, that the proportion of these children, that were reared, is uncommonly great; when we consider, that Mr. Barlow's "method consists in exciting premature labour *early* in the seventh month of pregnancy:" For it generally happens, that children, born in the beginning of the 8th month independently of any external violence, do not long survive their birth.

the cesarean operation. This bold project, worthy of the 18th century, if it had been more fortunate in its effects, presented with the eclat of a discovery important to huma-

The success of Mr. Barlow has rendered him very sanguine: He says, "I will venture further to advance, that even the *use of the crotchet* may be superseded by the method, which I am about to describe, and that the formidable obstetrical apparatus of knives, hooks and perforators may be happily banished in future from the Surgery"—To this assertion I must refuse my assent. To say nothing of the necessity of using these destructive instruments in some cases of preternatural presentation and monstrous conformation of the fœtus (see *Second Letter to Simmons* p. 252 and 270 &c.) the practice I am considering, though it may render their use less frequently necessary, cannot entirely supersede them. The propriety of inducing premature labour in any deformed woman can rarely, if ever, be determined upon, before the crotchet has been found indispensably necessary and actually employed in a previous labour. Indeed, unless the contraction of the tube, or canal, of the pelvis be very considerable and pretty accurately ascertained, it will scarcely be justifiable in any case to have recourse to this practice in all the subsequent pregnancies, until the woman has been delivered a second, or third time by the crotchet. For it has happened in a very great number of instances, that a woman, who has been delivered of her first child by the perforator and crotchet, has been afterwards delivered of one, or more living children at the full time. This observation is made not to discountenance

nity, could not fail to please and to be generally well received by practitioners as well as the public. Whilst its partisans were multiplying throughout Europe without examining it, some men united their efforts to shew that the operation ought to be submitted to the test of experiment, before it was adopted; others, equally few in number, far from partaking of the enthusiasm, which this discovery excited, thought it their duty to moderate this by opposing the operation and attributing to it certain inconveniences, which observation had not then pointed out, it is true; but which have been but too strongly confirmed since. Sigault, who at first thought, that it would give to the pelvis, in every case of bad conformation, the space necessary for the free passage of the child and invariably supersede

the inducing of premature labour, but to prevent the abuse of it. Fully sensible of the impropriety of arguing against the employment of an useful remedy merely on account of its being liable to be abused, I must contend, that this method of delivery should not be adopted on account of distortion of the pelvis, until the accoucheur is perfectly satisfied with respect to the necessity of it; otherwise, though undoubtedly applicable to beneficial purposes, it may become upon the whole injurious to the interests of individuals and the community. T.

the cesarean operation, further instructed by some cases, of which the consequences had been less fortunate than those which occurred in the case of Souchot, restricted it to to those instances, wherein the small diameter of the pelvis was at least two inches and a half. If he has not made this acknowledgment public, it must undoubtedly be attributed to his premature death. We can affirm, that such was his opinion before his death, having been called by him and one of his brethren, a physician at Paris, on the 19th of July 1785, to perform the cesarean operation upon a woman, whose pelvis measured only one inch eleven lines in the small diameter; this friend of truth pronouncing boldly, that the section of the pubes, in this degree of maleconformation, would not be attended with more success than it was in —— Vespres, operated upon on the 15th of November 1778. If the cesarean operation, performed with the full consent of this physician and several of his brethren, were not attended with more advantage to the mother than he hoped for from the section of the symphysis of the pubes, it preserved the child, who is now more than thirteen years of age.

The new operation was practised more frequently at this period, in the space of seven years and a half, than the cesarean section had been in the course of more than twenty-five years; and the general opinion began to change with respect to it. Its advantages and inconveniences could now be calculated from observation; the cases could be determined, wherein it could give to the pelvis an increase of diameter, necessary to the free passage of the child; wherein it could supply the place of some of those methods of delivery, that were previously known; and finally those too numerous instances, which left no other resource than the cesarean operation.

Of the thirty-four women, that had been operated upon, about the middle of the year 1787 (no case has since come to our knowledge), in France and other nations, and concerning which we have been able to collect some details (1), we observe that twenty-

(1) We do not include in this number the woman in the neighbourhood of Hesdin, upon whom Bonnard, surgeon of the district, performed the cesarean operation, on the 12th of February 1778, since he was not able to complete the section of the pubes, on account of the *ossification of the symphysis*, nor her, who underwent

three have recovered and eleven have died; that eleven infants only have been born alive and twenty-three dead (2). We shall acknowledge, in order to be correct, that several of these last appeared to be dead before the operation.—Amongst the twenty-three women preserved, six had laboured naturally before; eight have laboured naturally since, and perhaps a greater number even; but this we have not been able to prove, not having had an opportunity of informing ourselves of what has occurred to these same women within more than fifteen years. In this number of thirty-four there is not one woman, whose pelvis exhibits the greatest

this operation in the hospital of Lectours, on the 8th of July 1788, after every other method, even to the cesarean section, had been tried: because we think that these two facts belong rather to the history of the latter than the former operation.

(2) I have collected an account of all the cases of the section of the symphysis pubis, which I could find recorded, and have disposed them in two tables. The successful ones are thirty in number, and the unsuccessful amount to fourteen, as far as the parent is concerned. Twenty of the children were born dead, or died immediately after birth; fifteen were preserved, and of the remaining seven I have not been able to meet with any account. See *Second Letter to Simmons*, pag. 94. T.

deformity known. It has been publicly stated, that the pelvis of Dubelloy, upon whom Alph. Leroy operated, was only 21 lines in diameter, as well as that of another woman in the environs of Saint-Pol-de-Lion: But the six labours, which had preceded the operation in the former, and the three, that have since taken place, although none of the children have been born alive, sufficiently declare, that her pelvis, though ill formed, was not so much contracted as had been imagined, without bringing any other proofs; and the two very common and very fortunate deliveries, that have occurred to the latter female, leave no doubt with respect to the proper conformation of her pelvis. The pelvis of Vespres, upon whom Sigault operated in November 1778, and that of another woman, who underwent the operation in the great Hospital of Lyon, in December 1781, are the most defective of any, in which the section of the symphysis pubis has been practised, the diameter of the latter being only one inch seven lines, and of the former one inch ten lines. In the other patients the pelvis was much less contracted and we may assert, without fear of being contradicted by facts, although all their pelves should here-

after be procured and examined, that the pubes has not been successfully cut in any of those, which were less than two inches and a half, or exactly two inches and a half, in the small diameter of the superior aperture.

If all the women have not died of the consequences of the Sigaultian operation, it is to be attributed to these circumstances, that the pelvis was larger than it had been estimated, and that the separation of the bones was not so considerable as it was imagined; which may be easily proved. Vespres died on the fifth day after the operation: The woman at Lyon fifty-two hours after: A third, operated upon by Demathiis, on the ninth day: And another patient of Alph. Leroy about the end of the eighth. A surgeon at Paimpol, in ci-devant Britanny, saw a woman die, on the 11th of February 1783, an hour and a half after the operation, owing to the bones of the pubes being separated exactly two inches and a half (1). A woman at Arras died on the fifth day after the operation; one at Mons on the sixth day, in con-

(1) The pelvis of this woman and those of the two women, operated upon by Demathiis and Leroy, constitute a part of my collection. The small diameter of the two last measures exactly two inches and a half.

sequence of a separation of the bones to the breadth of four fingers; one at Dusseldorff on the eleventh; one at Gênes on the sixteenth; that at Spire on the eighth; one at Naples, during the operation (2); and another within twenty-four hours (3). The smallest of these pelves, which were divided at the symphysis pubis with so little advantage, was two inches five lines in its small diameter (4). The others were two inches and a half, two inches ten lines, and even three inches: The greatest separation of the bones of the pubis was two inches and seven lines.

If all these women have died of the consequences of the operation and of the great separation of the bones of the pubes, which cannot be doubted after the report of the opening of the body of those who were examined, who can allow with some persons,

(2) I have no further knowledge of this case than what is said by Lauverjat: Traité sur l' opération césarienne, pag. 252.

(3) The practitioner, when he communicated this fact to me, desired me not to mention his name.

(4) The pelvis of Vespres and the woman at Lyon are excepted from this number.

who still pretend to believe it, that the separation of the ossa pubis has been carried as far as three inches, without the least inconvenience, upon other women, whose pelves were much more contracted? If it has been necessary in the women, just mentioned, to employ a great deal of force in extracting the child, after it was turned, and to have recourse to the forceps and even the crotchet to disengage others, who can be persuaded that a separation of two inches and a half, or of three inches even, has opened an easy passage through pelves more contracted than those of the women, of whom we are speaking? If the majority of the children of those women have died during the strong efforts, necessary for their extraction after the operation, can it be granted, that other children, more remarkable for their bulk, have passed freely and without danger after the section of the symphysis pubis?

We know very well, at this time, what may be hoped for from the section of the pubes, and what may be dreaded from it, because we know to a single line, how much a given separation of the ossa pubis can add to each diameter of the superior aperture, and how far it will destroy the integrity of

the sacro-iliac symphyses; the advantages, resulting from the operation to the fœtus, and the dangers to the mother depending on the degree of increase of the diameters. We are no longer ignorant, that a separation of the ossa pubis to the extent of two inches and a half, for example, in adding more to the diameter, which was at first only two inches considered from pubes to sacrum, than to that which was three inches, became also more dangerous, in as far as it occasioned greater mischiefs in the sacro-iliac symphyses; and that the pelvis, which receives the greatest increase, does not thence become more proper for the free transmission of the child than one, which receives a slighter augmentation. What we have published upon this subject may be seen in the second and third editions of our work, entitled *L'Art des Accouchemens.*

It is then demonstrated by actual observation, that the section of the symphysis pubis, far from procuring to the most defective pelvis the width, necessary to delivery, does not even give it to one, which is only moderately contracted and is naturally two inches and a half in diameter: It is also proved, that this new operation is attended with great incon-

veniences both to the mother and infant, that it frequently presents great difficulties in the performance (1); that it has only proved successful in a small number of women and that this success is to be imputed to circumstances, which have induced impartial men to doubt, whether the operation was necessary in those cases. Nothing confirms more these truths than the reserve, which the most zealous advocates of this new operation at present use in practising it, although opportunities are not less frequently occurring than formerly. After it began to be practised, the first eight years furnished more than thirty cases; but since 1787 none has come to the knowledge of practitioners. If the success of an operation, which has for its object to save both the mother and child, be allowed

(1) It is well known, that in several cases it has been necessary to have recourse to a saw for the division of the bones of the pubes; that in other cases the surgeon has cut down upon one of these bones, at the side of the symphysis; and that Bonnard, surgeon at Hesdin, unable to complete the section of the pubes, was obliged to perform the cesarean operation. A collection of the observations, which we have only sketched here, would be very interesting: It might rank with those, which the end of the 18th century has produced of various kinds.

from the preservation of one of these individuals, the cesarean operation has had much more success than the section of the pubes in an equal number of women; the life of the child, always endangered after the latter, being constantly preserved by the former operation, and the life of the mother being exposed to no more danger by one than by the other.

If Paré, Guillemeau and a very small number of others have believed for a moment, that the cesarean operation is necessarily fatal; the practitioners of the 19th century will only view it, as we do, as one of the greatest operations of surgery, which ought to be performed, whenever it becomes necessary, because the performance of it is attended with still less danger than the omission of it and because no other can be employed in its stead. If those men, whose writings still command our veneration, have thought themselves right in regarding as fabulous the histories of cures, published in their time, or in considering those instances of success as *true miracles of nature*, we cannot, at the present day, carry our scepticism so far, without being wanting in good faith, or information, because the facts are

multiplied, and the greater number possesses that authentic character, which Paré and Guillemeau would have wished to meet with in those, alleged by Rousset in favour of his opinion. Those authors, who might have easily satisfied themselves of the truth of some of the facts, related by Rousset, ought to appear extremely culpable in the eyes of the generations, which more immediately succeeded them, and especially Paré, who had the greatest influence over the opinion of his brethren, as well on account of his situation as his uncommon genius and knowledge. They have not formally denied the possibility of performing the cesarean operation with success; they have contented themselves with saying, that it offered too little hope and too much danger to be recommended. Mauriceau went further in asserting that no case existed, in which the fœtus could not be extracted by the natural passage. If Rousset had lived in the time of the last mentioned writer, he might have given him a sufficient answer by calling to his recollection the subject of his 26th observation, in which it is remarked, that the mother and fœtus were both allowed to die, because it was judged impossible to apply the crotchet.

At the present day even, it is by tearing this homicidal instrument from the hands of accoucheurs, that we can hope to make them acknowledge the necessity and utility of such an operation.

It would be superfluous to collect new facts and add them to those, which the Memoir of Simon presents, if we had only to answer the objections, made against the cesarean operation since Paré, by Guillemeau, Marchand and several others; if we had only to prove, that it is not essentially mortal, and that wounds of the uterus heal like those of other parts (1): It would be

(1) Mr. Simmons contends strongly for the mortality of wounds of the uterus in a Letter, inserted in the Medical and Physical Journal for 1799, and yet in the 8th Volume of Medical Facts and Observations he has related a case, which occurred to him two years before he wrote the letter mentioned above, to prove that wounds of the uterus are *not* mortal. — The subject of this case, Ann Calvert, had been tapped by him in April 1797. She applied to him again, on the 21st of July following, to have the operation repeated. Mr. S. informs us, that the fluctuation was now obscure and that suspicions had arisen of her being with child. He ventured, however, to push a trocar into the cavity of the abdomen, midway between the umbilicus and pubes. Instead of water, blood flowed out in a considerable stream to the quantity of about six ounces; the cannula

sufficient to refer to Mr. Simon's Memoir and even to the work of Rousset, which contains some instances of cures of this kind amongst many other observations, that do not merit any degree of confidence. But we are endeavouring to fix the opinion of practi-

being then withdrawn, the hemorrhage ceased. The pain was greater than usual, but not so great as to excite any alarm, and the soreness after was little more than what she had formerly experienced. Mr. Simmons with great reason concluded, that the blood came from the womb, and I think it very probable, that the trocar passed into the placenta. He predicted an unfavourable termination; but the event shewed him to be mistaken. The patient was delivered of a fine healthy girl on the 26th of October following, "having suffered no inconvenience from the last operation;" so that she must have been in the beginning of the sixth month of her pregnancy, when it was performed.

It may be proper to observe here, by way of caution to the young and inexperienced reader, that this case shews 1st. the danger of wounding the abdominal viscera by the trocar, when it is used where the fluctuation is obscure, and 2dly. the propriety or necessity of examining female ascitic patients, or who are supposed to be such, *per vaginam*, previously to performing the operation of paracentesis upon them, especially where the accumulation of fluid is not very large and evident, and where any suspicion of pregnancy is entertained from the age of the patient, the suppression of the catamenia and other symptoms. T.

tioners concerning the advantages of the cesarean operation; the danger, which appears inseparable from and necessarily dependent on it; the cases, which require it; the place, where it ought to be performed; the time most favourable for practising it, and the most suitable after-treatment: And it is only from collecting and comparing a great number of cases, that we can hope to attain this end. In pointing out those, that have occurred since 1750 and are easily collected, we have to regret, that we cannot give an account of all the operations, which may have been unsuccessfully performed and concerning which the operators have remained silent; because these might have had their utility as well as the others. Those, which we announce, amount to the number of sixty-six. More than fifty of them took place on account of faulty conformation of the pelvis; five after a rupture of the uterus, or vagina; one owing to a scirrhous tumour, which obstructed the pelvis; and the remainder, because the child could not be turned and brought away by the feet, on account of its wrong position and the too strong contraction of the uterus. Twenty-four of them have been performed with success to the

mother, and all might have been attended with success to the child, if they had been performed in time. Some of the observations, announced by us, have been published by the practitioners concerned; others have been printed in periodical works; but the greater number has been communicated to the Academy of Surgery, or has been kept in the port-folio of several of its members, who have been waiting for an opportunity of making them known and employing them with advantage for the science.

Independently of these sixty six new facts, five others have been announced to the Academy of Surgery; namely, two by Warrocquier, Surgeon at Lille, who assured the Academy, that a surgeon in the environs of Gand had performed this operation twice in the linea alba with success; and the remaining three by Médérer, Professor of Anatomy and Surgery at Fribourg in Brisgaw, which were performed with complete success. Médérer promised circumstantial details of the cases and these, perhaps, exist in some corner of the Archives of this ci-devant Academy. Colombier, a physician at Paris, after hearing the reading of the observation of Hannequin and Chabrol, which will be

noticed hereafter, assured the ci-devant Royal Society of Medicine, of which he was a member, that the operation had also been performed with success in the presence of his father and Mr. Toutblanc, who were physicians, in 1752 at Sainte-Mene-hould by Buyret, surgeon of that Commune(1). To these may be added the very extraordinary case of a Negress in Jamaica, who performed the cesarean operation upon herself in 1769 and was completely cured in five weeks by Doctor Morton, at that time a physician at Kingston(2).

TABLE I.

Operations performed with success.

1st. The first of these operations was communicated by CAQUE of Rheims; the woman, who is the subject of it, had had two very laborious deliveries, previously to the cesarean operation, and it was not till after the trunk of the 3d child was pulled away, on the 17th of September 1782, that

(1) See the Memoires of this Society for 1777 or 1778.

(2) See the London Medical Journal Vol. VII for 1786; Journ. de Méd. de Paris, Tome 76.

this operation was performed. The cure was completed on the 14th of January following.

2d. Beaujeu, Surgeon at Martigni near Laon, performed it on the 29th of November 1753, upon a woman, whose pelvis was so strait, that two fingers could not be introduced. She was cured on the 31st day; but the child lived only 5 days.

3d. A Surgeon at Bossand, near Chabais in Saintonge, operated upon a woman, 46 years of age, on the 24th of May 1760; this was her 9th child and the first eight had come into the world naturally. The patient was perfectly recovered and went to church on the 24th day after. Given by Arondeau.

4th. Vermond saved the life of a woman and two children, of which she was pregnant, by operating upon her on the 17th of May 1767. She was at the full time of her fourth pregnancy and her three first children had been mutilated by the crotchet. Russel, Thevenot, Cabani, Lécluse, Hévin and Tronchin visited the patient during the cure, which was complete in 28 days.

5th. A Surgeon at Attichi near Compiègne, after having torn away both the arms of a fœtus, in October 1772, thought

proper to perform the cesarean operation upon the mother, who had born children before: He opened the abdomen and the uterus in a transverse direction on one side. The woman was cured at the end of five weeks.

6th. Millot operated with the greatest success on a woman, named Varin, in 1774, in the presence of several of his brethren. We have since attended this woman in several premature labours; and in one of her pregnancies we extracted the remains of a fœtus through a large ulcer in the parietes of the abdomen and uterus, which had supervened to a fall.

7th. Dufrechou, Surgeon at Symore in Gascony, performed the same operation in 1776 upon a woman, who was cured on the 30th day.

8th. Deleurie operated upon a woman with the same success, on the 9th of August 1778, and the cure was effected at the end of a month. This was her second labour.

9th. Chabrol and Hennequin performed this operation on the wife of an officer at Mézières on the 31st of August 1778; but the cure was not completed till after two months and eight days.

10th. RIOLLES, TROUARD, DELESTRES &c. operated upon the wife of a tavern-keeper at Dieppe, on the 19th of November 1778, after a labour of five days. She was able to go out after the 40th day.

11th. WARROCQUIER, Surgeon at Lille, operated on a woman in the presence of nine of his brethren, on the 11th of May 1780, and she was cured on the 45th day.

12th and 13th. LAUVERJAT performed the same operation with success on two very deformed women; the former, on the 21st of July 1782; the latter, in the end of February 1787. These two women, who were operated upon according to the method of this author (1), were cured at the end of one month.

14th. FAVEREAU, Surgeon at Jallais, practised this operation on the 18th of July 1786, after a labour of 3 days, and on the 20th of August following the woman was cured.

15th. LEFRANC, Surgeon at Pommeraie, performed it on the 28th of August 1787,

(1) For an account of Lauverjat's method &c, see Second Letter to Simmons pages 293—314 and First Letter p. 45 &c. T.

upon a woman, big of her 3d child; because he could not turn it. The cure was not finished before the end of two months (²).

16th and 17th. Soek, Surgeon at Leyden, operated upon two women with every desirable success; upon one, on the 13th of July 1789, who went out of doors on the 27th day; and the other, on the 21st of May 1792; her cure was equally complete on the 30th day.

18th. Lebas, Surgeon at Mouilleron performed this operation after a labour of 3 days, on the 26th of August 1769; and in the middle of October the woman was able to undertake her usual employment.

19th. The Same Surgeon assured Doctor Gallot, who communicated these facts, that he had operated upon another woman with the same advantage, two years before in the ci-devant province of Berri, where he then dwelt.

20th. Thibaut-Desbois operated upon the wife of a Notary of the City of Mans, on account of a rupture of the uterus, the 4th of October 1763, with so much success, that she was cured on the 30th day.

(²) These two cases of Favereau and Lefranc were communicated by Chevreul, Surgeon at Angers.

21st and 22d. LAMBRON, Surgeon at Orleans, has performed the same operation twice upon one woman (1), who has since laboured very fortunately. She was operated upon the first time, on the 9th of August 1775, and the second time on the 30th of December 1779.

23d. DUMAY, Surgeon at Fontenai-le-Peuple, performed the same operation on account of a rupture of the uterus, although the fœtus had not penetrated into the belly, on the 4th of Germinal in the 4th Year, (23d March 1796) and on the 30th day the wound was not larger than a shilling (2).

24th. Finally Mr. BACQUA has performed the cesarean operation more recently, namely on the 25th of Floreal in the 5th year, (14th May 1797) and has met with all the success, that could bedesired from it (3).

(1) The womb of this woman was lacerated in two successive labours and the infant, each time, passed completely into the cavity of the abdomen.

(2) This observation, highly interesting to the progress of the art, will be published at full length in the Recueil, when the further account of it, which has been requested, shall be received.

(3) See *Recueil Périodique* pag. 434, tom. IV.

If we be permitted to add to this Table the five other facts, announced as authentic to the Academy of Surgery by Warrocquier and Médérer, the fact, communicated by Colombier to the ci-devant Royal Society of Medicine and that of the negress of Jamaica, made known by Dr. Morton, we shall have thirty one successful cases and we do not doubt, but others, hitherto unknown, will soon be received.

All these facts do not equally establish the absolute necessity of the cesarean operation, and we are very far from applauding indiscriminately all these successes; for it might have been dispensed with in several of the cases, just related: But they incontestably prove, that this operation is not essentially mortal and that the danger, which accompanies it, frequently depends less on the importance of the parts, interested by it, than on the accidental circumstances, which afterwards present themselves; circumstances which have not always been well attended to by practitioners, and in the cure of which they have not had the courage to deviate for a moment from the ordinary rules, prescribed for the treatment of large wounds of the abdomen. With that boldness, founded on in-

formation, which Mr. Bacqua has shewn at different periods of the cure of the female, who is the subject of his observation, we might undoubtedly have obtained more success from the cesarean operation. If he had not taken care every day to destroy the adhesions of the parts, that kept the effused fluids far from the wound and opposed their discharge; if he had not introduced a catheter into the deep seated collection of matter, which threatened the most dreadful consequences, Mr. Bacqua, like many others, would have failed in attaining the end, which he proposed to himself, and would have furnished an additional arm to the adversaries of the cesarean operation, in making them acquainted with another victim. Vermond owed the preservation of the patient, whom he delivered of two healthy children, entirely to his introducing a *sonde de poitrine* (1) at

(1) A *sonde de poitrine*, or thorax-sound, very much resembles a female catheter; It is a silver tube about 5 inches in length and two lines in diameter. It is straight except at its anterior extremity, which is slightly curved for about 7 lines, and is closed at this extremity, but has two eyes or openings in the sides, about 6 lines in length and one in diameter. The posterior extremity is in the form of a funnel, that it may admit the siphon of a syringe,

different times through the wound and to his pushing a finger very deep, on the 6th day, in order to destroy the adhesions, which confined a quantity of fetid ichorous matter, that was occasioning very serious mischief; and Guénin, Surgeon at Crépy in Valois, at a very remote period, owed his success to the precaution, which he took, of slackening the suture nine hours after the operation, that he might push his finger into the cavity of the uterus and break the clots of blood, which obstructed both its orifice and the wound.

These fortunate cases appear very well calculated to animate those practitioners, who would still be afraid to perform the cesarean operation, under the pretext that it is essentially mortal, and to impose silence on those, who in our time renew the objections, which were made more than two centuries ago, with much more reason, against this operation. But these successes are not sufficient

and is furnished on the under side with a ring. This instrument is used in wounds of the thorax to push back the lungs and favour the evacuation of blood, pus or water; to break through slight adhesions and to conduct injections into the cavity: And it is applicable to the same purposes in wounds of the abdomen. T.

for the end, which we propose in a work of greater extent than this. Near these fortunate cases it is necessary to place all those of the same kind, which have not been successful to the mothers, or which have afforded no advantage. These, more numerous than the the former, being presented under the proper point of view in the Work, which we announce, will not be less useful than the others; they will contribute equally to the advancement of our knowledge. Besides, they will inspire practitioners of midwifery with that salutary diffidence, which leads to a consultation and to the assemblage of the greatest possible talents, when a great operation is to be performed, and will prevent them from undertaking the cesarean section alone, when the necessity and the urgency of it are not clearly demonstrated.

The operations, which have been performed unsuccessfully for both the mother and child, or which have only preserved the latter, and of which we have been able to collect any particulars, are forty two in number: We have not endeavoured to diminish the number of these, with the view of making the successful ones appear in a greater proportion. We should be glad to be made acquainted

with all the unfortunate cases, that have occurred in other nations as well as in France, in order to create still more aversion to this operation, which we have judged sufficiently dangerous to assure our pupils and to publish the opinion afterwards, that we can scarcely promise ourselves to save one woman in ten. (See the first and second editions of *L' Art des Accouchm.* Tom. II. § 1981.) The judgment, that will be formed of it from the Tables, which we are now offering, perhaps, will appear more consoling to humanity.

TABLE II.

Operations performed without success.

1st. A SURGEON of SAINT-ETIENNE in Forez being called to the assistance of a woman, who was exhausted by her pains, these having continued three whole days, and who could neither be delivered by the crotchet, nor any other means that had been employed, thought it his duty to perform the cesarean operation, notwithstanding the small degree of hope which he perceived of saving the woman. She died eight hours after. This case occurred in 1751 and was communicated by PARET.

2d. Ledoc & Gauthier, Surgeons at Verneuil au Perche, performed this operation in an equally hopeless case, but on account of a cause different from faulty conformation of the pelvis (1), on the 31st of July, 1754. The woman, who was forty years of age, died on the fourth day: The child was preserved.

3d. Ravenet, a Surgeon at Paris, with the approbation of Gervais & Barbaut, his brethren, had recourse to this operation on the 3d of March 1758, on a woman, the small diameter of whose pelvis measured only one inch ten lines, when divested of the soft parts. This woman died the next day: but the child was saved.

4th. Vermond performed it with as little success on the 12th of July 1767, in the presence of Ravenet, Levret, Russel, Thevenot, Lafaye, Malonet & Portier, physicians, upon a woman, whose pelvis was only two inches and six lines in diameter. This patient appeared sufficiently well on the sixth day, to be allowed to take a soup; but on the eighth

(1) This was a thick, hard and apparently scirrhous substance, which diminished the entrance into the vagina so much, that one finger could not be introduced without a great deal of pain.

some alarming symptoms took place after some domestic vexation, and she died on the eleventh. The child lived six months.

5th. Cosme d'Angerville performed the same operation on the 30th of October 1770, with the consent of Barbaut, Péan, Tenon, Levret, Destremeau and Braillet, upon a woman, who died on the seventh day: Her pelvis was only an inch and ten lines from the symphysis pubis to the sacrum, and only one inch four lines from the bottom of the left acetabulum to the same point of the sacro-vertebral angle: The child, which weighed seven pounds and a half, was preserved.

6th. Vimar, a Surgeon at Nouvion near Rhetel, was called to a woman, whom three midwives had in vain attempted to deliver: Being unable to accomplish the delivery by the natural passage, on account of an inflammatory swelling of the parts, he had recourse, on the 2d of September 1772, to the cesarean operation, which was neither successful to the mother, nor child, one arm of the latter having been previously torn off.

7th. Cleriau & Barbot, Surgeons at Troc in Vendômois, having been obliged to bring away the head of the child in pieces in

order to deliver a woman in her first labour, whose pelvis appeared to be only two fingers breadth in diameter, determined to perform the cesarean operation in her second labour, although they were not called in, until she had been eight days in labour. The woman died on the eleventh day after the operation, of convulsive paroxysms, occasioned by indigestion; her situation till then having only excited slight apprehensions.

8th. HENCKEL, in Prussia, performed this operation in 1769 upon a woman of 37 years of age, whose pelvis only measured three fingers breadth in the direction from pubes to sacrum: He operated in the linea alba: The woman remained very well till the fourth day; but after some imprudent attempts to make her bed she was seized with vomiting and died on the fifth.

9th. DELEURIE practised it without success on the 4th of April 1779, in the presence of our colleague Sabatier, upon a woman, whose pelvis was only two inches three lines and a half in diameter: She died on the fourth day; but the child was preserved (1).

(1) See Deleurie's *Dissertation sur l' opération césarienne à la ligne blanche.*

10th. Bonnard, a Surgeon at Hesdin, not being able to finish the section of the pubes, which he had undertaken, on the 12th of February 1778, in a woman whose pelvis appeared to him to be only two inches, because *the symphysis was ossified*, had recourse immediately to the cesarean operation. The mother, whom he could not see afterwards, died about the eighth day; the child was very large and healthy.

11th. Warrocquier, in February 1776, operated upon a woman, after a labour of five days, in the presence of all the surgeons of Lille: The child was saved, but the mother, who had been a long time phthisical, died on the eighth day, the wound being cicatrised throughout almost the whole of its length. This patient had experienced a very laborious delivery in April 1775.

12th. It appears from some notes, that the same surgeon operated upon a third woman, who was remarkably deformed, after a six days labour, and that she died on the fourth day from the operation. She had previously had a very laborious delivery.

13th. Siebold (Gaspard) of Wurtzbourg, having experienced great difficulties in the section of the pubes, on the 3d of February

1778, and not having derived from it the advantages he expected, preferred performing the cesarean operation, the 26th of September following, on another woman, who died eight days after. The pelvis was only two inches in diameter transversely, and three inches from before to behind (1). The child was preserved.

14th. and 15th. MOREAU and FERRAND performed this operation twice in our presence at the Hôtel-Dieu of Paris; the first time, on the 2d of July 1778, upon a woman, whose pelvis was only two inches and a quarter in diameter; and the second time, on the 5th of August 1779, upon another woman, the small diameter of whose pelvis was only one inch eight lines. The first of these women died 44 hours after the operation, and

(1) Mr. Baudelocque has committed an error respecting the dimensions of this pelvis, which are thus stated by Weidmann. — " Perlustrantes ossium pelvis syntaxim, videmus pelvim minorem in magna aperturæ superioris diametro habere 4 poll. 6 lin.; in conjugata 2 poll. 7 lin.; in altitudine synchondroseos pubis 1 poll. 4 lin.; in latitudine ossis sacri 4 poll. 2 lin.; in exitu extremitatis ossis sacri ad arcum pubis 3 poll. 6 lin. Distantia ossis ischii ab extremitate sacri 3 poll." *Compar. inter Sect. Ces. & Diss. &c. pag.* 23.

the second on the tenth day. The child of the latter was saved.

16th. 17th. 18th. LAUVERJAT, before he obtained the success, mentioned above, from the cesarean operation, had practised it twice in the linea alba without any advantage to the women, and afterwards, according to his own method, upon a third woman in the hospital of the ci-devant Schools of Surgery. The one, operated upon, on the 3d of August 1778, died on the fourth day; the other, on the 1st of February 1781, died on the fifth; the third, immediately after the operation. The small diameter of these pelves was 17 lines, two inches and a quarter, and two inches four or five lines. The children were preserved.

19th. and 20th. I have practised this operation twice without success to the mother, but with advantage to the child. The former of these operations was performed on the 19th of July 1785, in the presence and with the approbation of Sigault and Baignières, Physicians at Paris, of Desault and many other practitioners, upon a woman, whose pelvis measured only one inch eleven lines in the small diameter: The latter was performed in my practical school, under the eyes

of Louis, Desault, Chopart, Coutouly, Lauverjat and a great number of pupils, upon a woman, whose pelvis was only two inches two lines: One of these women died on the fourth day and the other about the end of the fifth. During several months I had previously attended the latter in a scorbutic cachexy, which was of long standing and in a very far advanced stage.

21st. 22d. 23d. and 24th. Antoine Dubois has operated upon four women with as little advantage, since the year 1788; upon two in Lauverjat's method and two in the linea alba. Three of these operations were performed in my presence, including that on the female named Vasseur. The pelvis of all these women was under two inches and a half, except that of Vasseur, which measured two inches seven lines and two inches ten lines when divested of all the soft parts. Two most laborious deliveries, according to the account given of them to the School of Medicine by M. Dubois, attested this state of faulty conformation of the pelvis of Vasseur and the impossibility of delivering her of a living child by any other means than the cesarean operation. The

children of all these four women were preserved.

25th. DESGRANGES has communicated an account of the same operation's having been performed in the large hospital at Lyon, the beginning of March 1781, on a woman, whose pelvis was only two inches two lines in diameter. The child was living: The mother died the next day.

26th. DANVERS, Surgeon at Corbeille, performed this operation, in the manner recommended by Lauverjat, on the 8th of March 1787, upon a woman, who had previously suffered three very laborious labours: She died on the sixth day.

27th. The fact communicated by GILBERT, Surgeon of the hospital of Lectours, is the most extraordinary of this kind that we are acquainted with. The woman had been in labour seven days and every thing almost had been tried with the view of delivering her, before she was taken to the hospital; there only remained to be practised the cesarean operation and the section of the pubes, before all the resources of the art were exhausted. These were performed in succession: The former served to extract the trunk

of the child and the latter the head, which was wedged fast in the pelvis, after the division of the neck. The woman survived all these operations several days. The diameter of the pelvis was two inches and a half.

28th. A SURGEON of the COMMUNE de ——, who had for a time quitted the practice of his profession in 1786, to hear my lectures, communicated to me a case, which ought to follow immediately that of M. Gilbert; the cesarean operation having been performed pretty nearly under the same circumstances, after the same attempts to accomplish the delivery by the natural passage, and the woman not having died till the eighth or ninth day. This surgeon had himself assisted in the operation (1).

(1) See the 2d and 3d edition of my *Art des Accouchemens*, Note to § 1723, tom. II. pag. 276.

The author informs us in the place referred to, that, after the body of the child was disengaged, a strong man, standing upon the bed of the patient, was obliged to pull a long time with all his force in order to extract the head, whilst another pushed it back with one hand introduced into the vagina, and that the woman appeared to be the victim of indigestion at a time, when her cure was confidently expected. He condemns in forcible terms the performance of the cesarean operation in those cases,

29th. DESAULT also performed the cesarean operation, in the night of the 5th & 6th of Fructidor in the third year (23d and 24th of August 1795), at the large Hospice d' Humanité, upon a woman of thirty-four years of age, who died on the seventh or eighth day. The smallest diameter of the pelvis was two inches three lines.

30th. and 31st. PELLETAN, since the period of the operation performed by Desault, has practised it twice, at the same hospice, in the linea alba: Both the women died on the second day. The pelvis, when divested of the soft parts, measured two inches in its small diameter in both these women: The children were alive.

32d. COUTOULY, who followed the method of Lauverjat in operating upon —— Desnos, of whom we have spoken above, has not been more fortunate than the rest. The operation was performed on the 20th of Ventose in the fifth year (10th of March 1797), and the woman died in 114 hours after: The child was preserved.

where the head is really wedged (enclavée) in the pelvis, and says the section of the symphysis pubis here promises greater advantages. T.

33d. and 34th. That we may conceal nothing, which has come to our knowledge, we shall add, that Gastrotomy was performed without success at Angers, on a woman almost dying, in order to extract from the abdomen a child, which had passed entirely into it after a rupture of the vagina near the neck of the womb, on the 5th of December 1781; and that another cesarean operation, announced by Camper to the Secretary of the Academy of Surgery in 1778, was performed in Holland upon a woman, who died almost immediately after she was put in bed. The small diameter of this pelvis was only eleven lines.

35th. The Paris Journal of Medicine, from 1770 to 1792, contains also some instances of the cesarean operation, performed without success. The first was communicated by PIETSCH, Professor of Anatomy and Surgery: It occurred on the 13th of July 1764 (1).

36th. THOMPSON performed this operation in the London Hospital, in the presence

(1) Journal de Médecine de Paris, tom. 34. pag. 170. Some authors have mentioned this operation as completely successful.

of John Hunter and Cooper, upon a woman betwixt twenty-three and twenty-four years of age, the small diameter of whose pelvis measured only ten lines and a half. She died five hours afterwards, but the child was born alive (1).

37th. JUPPIN, Surgeon near Rethel, performed the same operation, on the 23d of July 1779, upon a remarkably deformed woman, who had been in labour from the 19th. She died the next day (2).

38th. and 39th. M. S. had also recourse to the cesarean operation, in consequence of his not being able to accomplish the delivery differently, although the pelvis was not, perhaps, very defective: The former of these

(1) Journ. de Méd. de Paris, Mars 1772. Medical Observations and Inquiries by a Society of Physicians in London, Vol. IV.—The author has erroneously stated this operation to have been performed in the London Hospital, and appears to have been led into this mistake by Mr. Thompson's being one of the Surgeons of the London Hospital. It was performed at the poor woman's own home in Rose and Crown Court, Shoe Lane, London. See Dr. Cooper's and Mr. Thompson's accounts of the case in the 4th Vol. of Medical Observations and Inquiries. T.

(2) Journ. de Méd. tom. 54. p. 65.

operations was performed in 1780 upon a woman, who died in 24 hours after; and the latter upon a woman, who also died on the day following. One of the children was born alive; the other was dead (1).

40th. The same operation was performed at Bayonne, on the 8th of September 1785, upon a woman 36 years of age, after a labour of 4 or 5 days' continuance. It was not had recourse to till after having brought down the trunk by the natural passage and having cut off the head. The woman did not die till the seventh day (2).

41st. SOMMER, M. D. and Aulic Counsellor of the Duke of Brunswick-Lunenbourg, published in 1788 the history of a cesarean operation, performed eleven years before upon a woman, whose pelvis measured only *two* inches *four* lines in its small diameter. The operation preserved the life of two children, but the mother died on the 4th day. (3).

42d. A SURGEON at LYON has very lately informed us, that he performed the cesarean operation, in the course of last winter (year 6th), upon a woman, whose pelvis was only

(1) Journ. de Méd. tom. 62. pag. 159. (2) Ibid. tom. 68. pag. 287. (3) Ibid. tom. 79. pag. 296.

one inch and a *half* in diameter; but she died at the end of twelve hours.

Admitting *all* the cases, announced in this Memoir, we observe, that they amount to seventy-three; that thirty-one of these operations have been performed with success to the mother and almost all of them with success to the child; that amongst those women, who could not be saved, there were several, of whom no hopes were entertained before the operation (1) and others, who appear to have been the victims of causes foreign to it, as sufficiently well-founded hopes were entertained of them till the moment, when these causes exerted their disastrous influence (2).

We find some women in this number, in whose cases the operation did not appear to be necessary, since they had previously had ordinary labours (3) and since the practi-

(1) Of this description were the women, operated upon by Paret, n. 1; by Ledoc and Gauthier, n. 2; by Vimar, n. 6; by Gilbert, in the hosp. de Lectours, n. 27; and that in n. 28.

(2) Such are those mentioned in n. 4, 7, 8, 9, 11, 15.

(3) It by no means follows that, because a woman has had several natural labours, the cesarean operation may not become absolutely necessary in a subsequent one. The contrary is proved by the cases of Isabel Redman,

tioners performed it for no other reason, but because they could not turn the children and extract them by the natural passage, either because they were not sufficiently well informed, or because it was impossible to turn the child at the time it was undertaken, as sometimes happens, when an accoucheur is called several days after the discharge of the waters and when other persons have made many fruitless attempts: These cases are much more common in the country and small towns than in large cities, where there are more well informed practitioners and it is more easy to procure assistance in time.

Of these *seventy-three* operations, *thirty-five* appear to have been performed upon the side of the abdomen and *eighteen* with success; *thirty* in the linea alba and *ten* with success; eight in Lauverjat's method and *three* with success (1).

Some further researches, to which the discussion of this Memoir has given occasion,

Elizabeth Thompson and other women, whose pelves have become distorted in consequence of Malacosteon. See my First and Second Letters to Simmons, and the Appendix to this Memoir. T.

(1) See *Second Letter to Simmons*, p. 310, &c. T.

have made us acquainted with other facts, which we add here in expectation, that a still greater number will come to the knowledge of the Society. Some of these facts are announced by Tenon, in his Memoirs on the Hospitals of Paris; others by Weidmann in a Latin Dissertation, under the form of a Thesis, supported on the 9th of September 1779, under the presidency of Siebold (1); and in the second No. of the Bibliothèque Germanique Médico-chirurgicale of Dr. Brewer. But the most extraordinary fact is found in our Port-folio.

Tenon, in his Memoirs on Hospitals, pages 251 &c, announces, that the cesarean operation has been performed unsuccessfully six times at the Hôtel-Dieu of Paris from 1773 to 1785 inclusively (2); that Pean has communicated to him another fact; that Isabeau, Surgeon of the Hospital of Gien, performed it in 1753; Lambert on ——

(1) This Dissertation is entitled: "Comparatio inter Sectionem Cæsaream & Dissectionem Cartilaginis & Ligamentorum Ossium Pubis in Partu, ob Pelvis Angustiam impossibili, suscipiendas."

(2) Two of these operations, performed in 1778 and 1779 by Moreau and Ferrand, are comprehended in the table, which we have given.

Castanet of Verrières, in 1763, and that the master of a forge near Orleans practised it upon his own wife, at a more recent period. He also makes mention of a case found by Goulin; of that of Mercet, preserved by Dalechamps; of one of Rousset, omitted by Simon; finally of that of Buyret, Surgeon at Sainte-Menehould, of which we have taken notice above.

Pelletan has informed us, that he never saw this operation performed in the Hôtel-Dieu of Paris, except once, in the course of eleven years preceding 1773, during which he was employed in this hospital.

Weidmann, in his Dissertation, relates:

1st. That the cesarean operation was performed with success in 1741, by the chief surgeon of the Bicêtre, upon a woman dangerously affected with a venereal complaint; but some eye-witnesses of the fact can still attest, that this woman died on the 18th day.

2dly. That Hermann Schuzer performed it in 1758, upon a woman, who died on the fourth day.

3dly. That Cooper had two cases, in which it was practised without success; one of the women having died twenty-six hours after and the other at the end of a few hours.

One of these cases has been given in our table under the name of Thompson.

4thly. That George William Stein has had recourse twice to this operation, with equal want of success to the women; one of whom died on the third and the other on the sixteenth day.

5thly. That Atkinson also performed it upon a woman, who died on the fourth day.

6thly. and lastly, He quotes from some news-papers the history of the operation, performed in Transylvania (twenty years ago) upon the Countess of Cheirey by Zimmermann, in order to extract a monstrous infant; an operation that had the most complete success.

The Bibliothèque Germanique of Brewer, independently on the principal part of these cases, which it also enumerates, has made the following ones known to us. It is there remarked:

1st. That Schmucker, in his Mélanges de Chirurgie, makes mention of a cesarean operation, performed with success upon a woman in the sixth month of her pregnancy, in consequence of her having been wounded by the horn of an ox, which had penetrated into the

womb and had occasioned the child's arm to protrude at the wound (*).

2dly. That Leber practised it with equal success upon a woman, who had previously been delivered three times (1).

3dly. That Dr. Fischer saw a woman at Leyden, who had been operated upon, eighteen months before, by Dr. Brand; that she and her infant were both very well; that he saw the cicatrice and that a surgeon, who was an eye-witness of the operation, assured him that the diameter of the pelvis was less than two inches (2).

4thly. That Starke, Professor at Jena, performed the same operation in 1782 on the 18th of December, and that the woman was cured on the 24th of February following (3).

We shall finish this account by a fact of a much more extraordinary kind than any thing, that has yet been presented, which was communicated to us by M. Lair Corigny, Officer of Health at Thorigny, in the Department

(*) Large wounds of the gravid uterus ought to be enumerated amongst the cases requiring the cesarean section. See Second Letter to Simmons, p. 204. T.

(1) Richter Chirurg. Biblioth. Vol. VII. p. 555.

(2) Ibid. p. 768. (3) Ibid. Vol. VIII. p. 226. T.

of Manche, on the 24th of Thermidor in the second year (11th of August 1794).

—— Brument of the Commune of la Frenaye, in the District of Candebec, Department of the Lower-Seine, aged thirty-nine, mother of several children and in the eighth month of her pregnancy, received a blow from the horn of a bull in July 1789, which opened the hypogastric region transversely and the anterior part of the womb, to the extent of more than ten inches. She was in the fields at the time this happened, at a considerable distance from home. The child immediately passed through this extensive laceration, which was attended with a prodigious loss of blood. The persons about this woman, being alarmed by her situation, durst not attempt to do any thing to relieve her, before the arrival of M. Lechaptois, Surgeon of the Commune of Lislebonne, which is a league and a half distant from that of La Frenaye, and contented themselves with wrapping the infant, which was alive, in an apron, without dividing the navel-string; so that more than an hour and a half passed, before she obtained any assistance. Lechaptois began by dividing the funis umbilicalis to separate the child from the mother,

who was in such a feeble state, that her pulse could scarcely be perceived. He then extracted the placenta through the wound; the womb being contracted and the hemorrhage restrained. He afterwards cleaned the intestines and the neighbouring parts, which were covered with blood and earth, by means of a sponge moistened in wine and water, replaced them in the cavity of the belly, made eight stitches of the quilled suture and covered the whole with a suitable dressing and bandage. After this the woman was carried home, the operation having been performed in the middle of the fields. The child lived eight hours and was carried to the church to be baptized. The next day M. Lair-Corigny was called in consultation. The patient was very thirsty, the pulse was small and very frequent, and the abdomen hard and painful, which induced them to relax one of the stitches a little. Her sufferings were less afterwards. Some chicken-broth and barley water with syrup of vinegar were directed for her drink and glysters and fomentations of a similar kind were employed. Ten days after, Lair-Corigny saw the patient again and found her as well as could be expected. She was neither feverish nor

thirsty; but, as she complained of a disagreeable taste, a gentle laxative was administered with advantage. The lips of the wound were almost united at this time, except in one place, where two of the stitches had cut through the parts and excited suppuration. The cure was completed at the end of six weeks. Five years after this enormous wound, the woman enjoyed very good health and had no other inconvenience than that, resulting from a hernia in the part, where the two stitches had divided the lips of the wound.

If we add to the Tables, given above, the cases announced by Tenon, Weidmann and Brewer, which are not comprehended in them (1), as well as that, which Pelletan witnessed, and that communicated to us by Lair-Corigny, the number will be ninety-

(1) We omit here from the account, given by Tenon, two of the operations, performed at the Hôtel-Dieu, because we have mentioned them under the names of Moreau and Ferrand; the fact, which he says was found by Goulin, because it occurred in the fourteenth century; that of Mercet, preserved by Dalechamps, and that of Rousset, overlooked by Simon, because they are of very ancient date and we have not chosen to admit any but the operations, practised since the year 1750. The same reason has induced us to take no notice here of the cesarean section performed at the Bicêtre in 1741,

three. And, since in the twenty additional cases there are six successful ones to the mother, the number of operations, performed with success, will amount to 37, and the number of unsuccessful ones to 56 (1).

A Note relative to the Delivery of — Marville.

(See the 15th and 16th pages, to which this note has a reference.)

A new case, which has occurred since the first reading of this Memoir to the Society of Medicine, proves so clearly the truth of all

although related by Weidmann. One of Cooper's cases, mentioned by Weidmann and that of Buyret by Tenon are suppressed here also, because they are in the Tables.

(1) In my two *Letters to Simmons* I have collected 112 successful and 43 unsuccessful cases of the Cesarean Operation: This Memoir contains an account of 23 successful and 43 unsuccessful operations, not noticed in my Letters: And the Appendix comprehends two additional operations, that have proved fatal to the mother. Hence, the whole number of Cesarean Births, of which I have been able to find any account, amounts to 221: And since M. Baudelocque has shewn, that the operation, performed in the Bicêtre and mentioned in my 2d Letter, page 284, as successful on the authority of Schuzer and Weidmann, was really not attended with success, the woman having died on the 18th day, the number of successful cases is 134 and of the unsuccessful 87. T.

these assertions, that *the founder of the anti-cesarean school* himself cannot now have any doubts, being more interested than any other person in this fact, which is his own work: It is the case of —— Marville, Sepulchre-Street, No. 711.

This woman, having arrived at the full time in her first pregnancy without any other complaints than those, which are very common to women with child, was first attacked with labour-pains in the night betwixt the 11th and 12th of last Fructidor (year 6th) (1) and sent for a student of medicine, who had bled her eight or ten days before. This young man, sufficiently versed in the practice of midwifery to know on examining her, that the degree of faulty conformation of the pelvis would present a very great obstacle to delivery, sent, about six o'clock in the morning, for M. Danian his Professor, who imparted to me, about ten o'clock, his fears and his views with respect to the means of delivering this woman, provided M. Sacombe, whom he intended to get called in, should refuse his assistance.

(1) The 28th and 29th of August, 1798. T.

This physician, whose assistance could not be procured, after a great deal of trouble, before five or six o'clock in the evening, having examined the patient and found that the labour was fairly begun, declared she would be delivered without the aid of any instrument and of a living child: He remained with her and also some of his pupils: On the 17th he called a consultation in his own name as well as in that of the husband of his patient. Messrs. Vitet, Physician and Member of the Legislative Body, Marchais, Boyer, of the School of Medicine of Paris; Sue, the younger, Leclerc, Physicians, and myself were called to this consultation, which took place betwixt six and eight in the evening. Sacombe gave us an account of what had passed during the five whole days, that he had attended this woman, without however noticing the medicinal means, that he had employed. He declared he had believed, that the labour would terminate fortunately and that the child would be born alive, although the superior aperture of the pelvis was contracted and the distance betwixt the ischiatic tuberosities, or the transverse diameter of the inferior aperture, appeared to him to be only 18 lines, upon this ground,

that nature, who gave to this woman the faculty of conceiving, would not refuse her the power of bringing forth. He added, if he had published in his writings that there did not exist any case, in which the female could not be delivered of a living child, it was because his practice had not at that time offered him an example of the kind; that he acknowledged the existence of such cases now that he had met with this, for which we were consulted; but that he still hoped the patient might be delivered without assistance, although her infant had been dead several days, because she was in a good state both as to strength and health.

Marchais, Vitet and myself examined this woman; Boyer, Sue and Leclerc declined it for fear of fatiguing her. We were of opinion, that the antero-posterior diameter of the superior aperture was betwixt two inches and a quarter and two inches and a half in extent and I added, that the transverse diameter of the inferior aperture, which Sacombe estimated at only 18 lines, was nearly of its usual length, without however examining it with much attention.

The state of the woman did not appear to us so flattering as he had announced; the

face was altered; the respiration rather hurried; the epigastric region and all the right side of the abdomen, in which the intestines were chiefly situated, were tumefied and tense; the pulse was frequent, rather irregular and weak; the tongue dry and reddish verging to brown.

The persons, called in consultation, were unanimous in their opinion concerning the situation of this woman and the necessity of proceeding to her delivery, which had been already too long deferred, of opening the head, with this view, and afterwards extracting the child by means of the crotchet. Agreeing perfectly upon this point with my brethren, I added, that, by delivering the patient, the progress of her complaints would not be put a stop to and the event would be unfortunate.

Although Sacombe appeared to acquiesce in the proposal of the practitioners, who were joined with him in consultation, yet he did not deliver the woman till the next day, the 18th, betwixt noon and two in the afternoon, and about the middle of the seventh day of the labour: He made use of the crotchet. The woman died on the 23d at noon, about the end of the fifth day from her delivery.

Copy of the Report of the opening of the body of this woman.

On the 25th of Fructidor in the sixth year of the French republic (1), we the undersigned, having been called to the opening of the body of the wife Marville, at No. 711 in Sepulchre-Street, who had died the preceding day, at noon (2), of the consequences of a laborious delivery and whose infant had been extracted by means of the crotchet from above the superior strait of the pelvis, agreeably to the unanimous advice of the citizens Marchais, Baudelocque the elder, Boyer, Vitet, Leclerc, Sue &c, who were joined in consultation, perceived nothing externally, before the opening of the body, except a faulty conformation of the legs and thighs.

On laying open the cavity of the abdomen we did not observe any effusion whatever: The stomach and intestines appeared to us of their natural colour, except that we remarked the vessels to be a little more distended with

(1) The 11th of September, 1798. T.

(2) There is an error here in the date; I have seen the letter of the citizen Sacombe to citizen Baudelocque, dated the 24th, announcing that the wife Marville died the day before, at noon. *Note du Rédacteur.*

blood upon the lower portion of the arch of the colon, which was extremely distended with air, than on the other viscera: The liver, the spleen, the pancreas and the kidneys were in their natural state; but the womb and the other parts of generation, as well internally as externally, were in a complete state of gangrene and putrefaction.

On paying attention afterwards to the pelvis, we found that the diameter, taken from the projection of the last lumbar vertebra to the upper part of the symphysis pubis, was only two inches four lines: The lateral diameter measured five inches: The extent, from the union of the body of the right os pubis with the os ilium to the projection of the last vertebra of the loins, was only one inch; and from the left os pubis, the extent was two inches and a half: The distance betwixt the tuberosities of the ossa ischia was three inches (1): With respect to the

(1) We have here another instance of an irregular, or oblique, superior aperture of the pelvis, such as is described in my *Second Letter to Simmons*, p. 188 &c, and figured in Plate VIth. T.

thorax and head we found all the viscera in their natural state.

PARIS, the 25th Fructidor, 6th year of the republic.

The signatures of citizens MARCHAIS, LECLERC, SACOMBE, and BOYER are annexed.

RESOLUTION *of the Society of Medicine of Paris, upon the Researches and Reflections of Citizen* BAUDELOCQUE.

The Society of Medicine, after having heard two readings of the Memoir of Citizen Baudelocque on the cesarean operation and the interesting discussion, to which it has given rise, considering;

1st. That it is demonstrated by experience, that cases do exist, in which delivery by the natural passages is impossible.

2dly. That in many of these cases the cesarean operation is the only mean, which affords any hope of saving the mother and child;

3dly. That this operation, however dangerous it may be, has been often practised with complete success.

Is unanimously of opinion, that it is the duty of the physician to have recourse to the cesarean operation in the cases, determined by the art. And in order to enable the learned as well as the public to form a judgment of an operation, which so nearly interests humanity, social order and the progress of the art, the Society decrees:

1st. That the Memoir of Citizen Baudelocque shall be printed in the next number of its *Récueil Périodique* with the Extract of the Report of the Sitting of this day.

2dly. That the Account of the delivery of the wife Marville and the Report of the opening of the body of this woman shall likewise be printed at the end of this Memoir.

3dly. That two hundred copies of this Memoir shall be taken, in order to be distributed amongst the different administrative and judiciary bodies.

A true Copy,

Sue, the elder, Secretary-general.

SECOND MEMOIR.

REPORT *upon an observation communicated by* M. R. TARBES, *officer of health at Toulouse, concerning the cesarean operation; and* RESEARCHES *and* REFLECTIONS *upon several other cases of the cesarean operation.*

Read on the 27th of Pluviose, year 7th (15th of February, 1799).

BY M. BAUDELOCQUE.

First Case. M. Tarbès, in presenting this observation, seems to have had no other end in view than to satisfy the desire, that I have manifested, of becoming acquainted with all the cesarean operations, which have been performed since the year 1750 with or without success, in order to draw from them some corollaries useful in the practice of this operation (1). He not only speaks of the case as an eye-witness, but adds some reflections, which he submits to the judgment of the Society.

The cesarean operation, in the case announced, was not the consequence of an ignorance of the principles of the art, as has been so often remarked, but that of a rigid

(1) See above pages 64 and 76.

observance of these same principles. Fifteen professors of the school of Montpellier, celebrated for ages, pronounced upon the impossibility of delivery and the necessity of this operation. Fourteen in some measure presided at it, or were eye-witnesses as well as M. Tarbès, a pupil of one of them.

The woman had been in labour during three days and the waters had been evacuated for twenty-four hours, when Serres, professor of midwifery, was called to her assistance. Her stature was only three feet and a half, or thereabout (1 mètre 1 decimètre 6 centimètres): Almost the whole habit of her body bore the marks of ricketts, with which she had been afflicted in the first years of her life; and the diameter of the superior aperture, passing from the pubes to the sacrum, appeared to be only two inches (5 centimètres $4\frac{1}{10}$ millimètres).

The external incision was made on the left side of the abdomen, along the external margin of the musculus rectus, below the umbilicus, because this side was more prominent than the other. That of the womb was begun about the lower angle of the former and was at first made only of sufficient length to allow one finger to be passed into the

cavity of this viscus, in order to direct the instrument, with which the incision was to be finished by cutting from below upwards and from within outwards.

After the extraction of the child, which was dead, and the placenta, two stitches were made, not very tight and sufficiently distant from the lower angle of the wound to permit the discharge of any humours, which might tend to escape this way and to allow of injections, provided these should become necessary.

The patient appeared to be pretty well during the three first days, although she had gotten no sleep and the lochia had not been discharged any way. But on the fourth day the fever became very high and the abdomen was tumefied: Vomiting and purging of a blackish matter supervened in the course of the fifth day and she died on the sixth.

On opening the body they discovered 1st. an effusion of a whitish matter near the right iliac fossa, resembling the matter of lochia rather than pus, and to the quantity of about a glass. 2dly. That the wound of the uterus was nearly healed. 3dly. That there was no inflammation and that all the abdominal viscera appeared very sound. 4thly. That

the diameter of the pelvis, estimated at two inches before the operation, was only one inch and three quarters (4 centimètres 7 millimètres).

M. Tarbès, struck with the little success of the cesarean operation, thinks that we should succeed more frequently, if we could produce a discharge of the lochia by the natural passage, without however believing that this is indispensably necessary, since he is not ignorant that they passed constantly by the wound in the woman operated upon by Soumain. It would undoubtedly be a very great advantage to keep the neck of the womb constantly open for the lochia, to hinder them from passing through the wound of this viscus and thus prevent the effusion of them into the abdomen: But we should still more certainly ensure the success of the operation in question, if we could prevent the suppression of this important discharge: For it is not so much the retention, or the effusion of the lochia, which proves mortal, as the causes, which hinder the filtration of this matter.

Anodyne and relaxing injections, thrown up through the os uteri, appear to M. Tarbès as well as several other practitioners, very

proper to diminish the irritation of this viscus, and its spasmodic affection, and to determine the discharges to take their natural course. But we cannot always apply them, says he, either because the os uteri is so far closed, that the pipe of a syringe cannot be introduced, or because it is turned away from the axis of the vagina in such a manner, that the finger cannot reach it, as was the case in the woman, whom he saw operated upon in 1773. He thinks we might secure a facility of throwing up injections in all cases and at all times, by introducing a tube made of elastic gum, of a suitable length and diameter, through the vagina into the neck of the womb immediately after the operation; which should be pierced with two large holes on the sides of one of its extremities and furnished, near the other, with two small silver rings, suitable for receiving a ribband, destined to fix it and keep it in its place, as we do a pessary with a stem. M. Tarbès thinks, that the blood and lochia finding constantly a free vent by means of this cannula, would not easily escape into the abdomen through the wound of the uterus; that we might repeat the injection, whenever we pleased, by removing this tube, and extract

the coagula with our fingers, which could not otherwise be discharged.

The opinion of M. Tarbès will appear new only to those, who have not consulted the earliest writers on the cesarean operation. Rousset and, after him, Ruleau have recommended the use of a pessary, in the form of a cannula, in the treatment after this operation. Both proposed that it should be made with the end of a wax-taper pierced; that it should be covered with fine linen and that it should be introduced quite into the cavity of the womb. Both recommended also, that we should withdraw it and replace it every time we wished to use an injection, or to give vent to the retained matters: But it does not appear from any observation, that this has been employed, and these authors have taken great care to inform us, that it is not absolutely necessary.

The inconveniences of this practice at the present time strike us much more than its advantages; and, should they even be less than we suspect, they would appear sufficient to induce us to reject this pessary. A cannula of this kind, introduced into the cavity of the womb, would be more likely to retain the lochial discharges than to furnish them a

passage: It would determine them rather to pass through the wound than by the natural way: It would more certainly serve to augment the spasm, irritation and inflammation than to prevent or diminish them: Consequently it would aggravate the consequences of an operation, very dangerous in itself, if the womb could support its presence.

This cannula, by remaining in its place, would at most afford us a facility of using injections, the advantages of which are perhaps as much abused as the obstacles, that have appeared to hinder their use: For the difficulties, which we meet with, depend much less on the contraction, or closing of the orifice of the womb than on the deviation of this orifice. We should always find it sufficiently open, if we could place the woman in a situation, that would allow us to reach it and introduce into it the pipe of a syringe. Admitting the necessity of these injections, it would appear to us much more prudent to throw them through the wound of the uterus, which is constantly more open than the os uteri on the first days after the operation, though it would appear to have been equally inaccessible to the finger in the case, related

by M. Tarbès. It was not possible, says he, to find it the next day, by passing a finger under the abdominal parietes, so far was it removed from the external incision.

On reconsidering the manner of performing the cesarean operation in the case in question; the reasons which determined it to be made on the left side; the relation of the womb with the place, where the external incision was formed, and the change which this relation must necessarily receive after delivery, we easily conceive why the wound of the uterus could not be found the next day, by carrying the finger under the parietes of the abdomen. The womb being inclined towards the left side of the belly, since this was the most prominent part, must have presented to the edge of the instrument its anterior and right lateral parts, and, perhaps, if attention had been paid to the circumstance, the uterine wound would have been found on this side, on opening the body. After the operation, the womb sinking under the linea alba, which was at a great distance from the external wound, diminishing in bulk, losing its obliquity and arranging itself in the vertical line of the woman, and thus approaching to its natural position,

this wound must have concealed itself very deeply under the linea alba and perhaps beyond it, in passing towards the right side of the belly. By placing the woman upon her left side, whilst the finger was employed in seeking for this wound, it would perhaps have become apparent, even to the eye. The inconvenience, remarked in the case related by M. Tarbès, would not have taken place after the operation in the linea alba, if none of the precautions, recommended for performing it methodically, had been neglected.

Although this fact, which we are considering, does not seem very interesting in itself, since the operation was unsuccessful, we think the Society ought to give it a place in the *Recueil* as well as the four following ones. These cases in augmenting the number of those, which the Society has already made known, will serve like them to determine the degree of confidence, that ought to be placed in the cesarean operation.

Second Case. The first of these four cases might, in some respects, appear to be my own and probably some have been pleased already to consider it as such, although I only executed what nine persons, equally well informed in the different branches of the

healing art, had deemed indispensably necessary ; as the professor of Montpellier, Serres, in the preceding case was only the hand of the fourteen other professors, who had voted with him for the operation.

On the 13th of Pluviose in the seventh year (1st of February 1799), M. Plessmann, our colleague, desired Messrs. Marchais, Pelletan, Ané and me, to give him our advice respecting a woman, who had just been brought to the house of Mrs. Pradier, a midwife, and who, he thought, could not be delivered without performing an unusual operation. We did not see this woman till about six in the evening ; we all examined her and agreed, that it was physically impossible to deliver her of a living child by the natural passage and that the cesarean operation was indispensably requisite ; the diameter of the pelvis, taken at the superior aperture in the direction from pubes to sacrum, appearing to us at most only $2\frac{1}{2}$ inches (or 6 centimètres 7 millimètres). But we thought it proper to defer the operation till next day, as the first pains had only come on about four o'clock in the morning and the liquor amnii had begun to be evacuated. As the woman was in want of necessaries, she was carried about

half past nine in the evening to the hospital of the School of Medicine and operated upon the next day, the 14th, at two o'clock in the afternoon, after a very solemn consultation, in which nine persons out of ten voted for the cesarean operation and one only for the section of the pubes.

I performed the operation in the linea alba, in the presence of the consulting practitioners and a prodigious number of pupils, who could not be kept out of the room. I opened the womb in the middle and anterior part, making the two incisions only 4½ or 5 inches in length (from 12 to 13 centimètres 5 millimètres), because the child appeared to be of moderate size. The edge of the placenta was found in the direction of the uterine wound.

The right arm of the child crossed obliquely the incision of the womb and, not being able to push it aside on account of the strong contraction of this viscus, the waters having been evacuated about thirty-four hours, I disengaged it, that I might seize the feet with more ease, which lay on the right side at the posterior part of the womb under the fundus. The extraction of the child was

not difficult and nature expelled the placenta almost immediately.

The womb on contracting sunk behind the teguments, lying betwixt the inferior angle of the external wound and the top of the pubes. A portion of the omentum and some turns of intestines then presented themselves: These were reduced, whilst we brought together the lips of the wound, and almost before they had been exposed to the air of the atmosphere. A slip of fine linen, some lint, compresses and a bandage constituted the whole dressing.

The operation lasted about 13 minutes: The woman supported it with courage and without impatience. A very small portion of the omentum was the only part that appeared after the external incision, having disengaged itself from under the uterus on the left side. This incision scarcely bled at all and that of the womb appeared to bleed more only because it interested the part, where the placenta was attached. Perhaps the quantity of blood, lost during the operation and dressing, would be much exaggerated by estimating it at two pallets and a half.

The patient, during the first two hours, complained only of a little difficulty of respi-

ration, which she attributed to the tightness of the bandage, but which most assuredly depended upon another cause.

About four or five o'clock in the evening, she had some degree of delirium, which I attributed to the abuse of an antispasmodic potion, containing thirty drops of liquid laudanum, and perhaps of wine, which had been prescribed in the first moments to support her strength. She ceased taking the potion and this slight delirium disappeared.

About nine or ten o'clock the pulse was contracted, slow and feeble; but the belly was soft. The lower part of the dressing was very moist and the discharge had been rather copious. The respiration was short, difficult and accompanied with a kind of rattling in the throat, which was troublesome to the patient. Before the operation this woman coughed and expectorated freely; afterwards she durst not, or could not, either cough, or spit, on account of the pain arising from these efforts. A potion, composed of borage-water and oxymel of squills, produced a slight expectoration: The respiration became more easy and the rattling ceased. She had some sleep during the night and a more copious

discharge took place from the wound than on the preceding evening.

The day after the operation, about ten in the forenoon, the situation of the patient presented nothing very alarming; the pulse was more free, the respiration less hurried and more regular, the inclination to cough and spit less frequent: But these favourable appearances vanished almost at the instant, that a crowd of pupils rushed round her bed to be witnesses of the dressing of her wound. The pulse again became contracted and the breast was so much affected, that she could not swallow half a spoonful of wine, without being menaced with suffocation.

A portion of the omentum and some circumvolutions of the small intestines protruded through the wound, whilst the dressing was removed, and were immediately reduced. At this dressing we made use of straps of sticking plaister, dry lint, compresses, an uniting bandage and another bandage to secure the whole. The catheter was passed, as the patient had not made water since the preceding evening: A gentle clyster was administered and she was removed to another bed.

If we had entertained hopes, on visiting this woman, about ten o'clock, that the day

would pass without any great alarm, we left her about eleven, fearing that we should not find her alive in the evening. The delirium reappeared soon after; the respiration again became painful, laborious and even convulsive; the rattling took place and her jaws were occasionally locked: About three in the afternoon she was in agonies and she died betwixt five and six (27 or 28 hours after the operation).

I shall not dwell here upon every appearance, which the opening of her body presented: Reserving these details for another opportunity, I shall only direct your attention to the most important points and leave them to your consideration.

Notwithstanding the tumefaction of the abdomen, which did not supervene till after death, the straps of adhesive plaister kept the lips of the wound pretty near each other, so that nothing had been able to insinuate itself betwixt them, except some very small portions of the omentum. These straps being removed, the wound was found to be only four inches one line in length (or 1 decimètre $1\frac{4}{10}$ centimètre) and $2\frac{1}{2}$ inches in its greatest breadth (or 6 centimètres $7\frac{6}{10}$ millimètres).

The omentum was spread out under the wound, forming as it were its bottom, and was in a sound state. The small intestines, the arch of the colon and the stomach were very much distended by an elastic fluid, but were not altered. The wound of the uterus was still $3\frac{10}{12}$ inches long (or 1 decimètre $3\frac{6}{10}$ millimètres). This viscus was inclined towards the forepart of the right iliac fossa and its cavity was filled with blackish clots of blood; Similar clots of blood, connected with these and with the clots issuing from the lower angle of the external wound, were effused betwixt the womb and the peritonæum. The whole quantity was estimated at a pallet and a half. The abdomen contained likewise a little of a reddish serosity. The lungs were distended, as if they had been inflated, and were of a lead colour: each cavity of the thorax contained about a pallet of bloody serosity.

The child, which had been supposed to be very weak before the operation, scarcely shewed any signs of life at the time of its birth; but with a little care it was so far re-established, that we left it an hour after, without any anxiety concerning its life, or preservation. Being placed for a considerable

time upon a tolerably warm stove and afterwards laid very near it, the child grew weaker again and died about six o'clock.

This case and that of M. Tarbès appear as proper to engage your attention as the two following, with which they form the most remarkable contrast. In one, fifteen professors of a celebrated school pronounce upon the necessity of the cesarean operation: It is performed by one of them under the direction of the others and is unattended with success. In the other a number of practitioners, almost equal to that of the professors of Montpellier, see no other resource than the cesarean operation: It is performed in the midst of this crowd of luminaries and the event is not more fortunate. In one of the two following cases, one man constitutes himself the arbiter of the destiny of the woman and her infant; he decides upon the necessity of one of the most important operations of our art; he undertakes it without any assistants except her husband, a woman eighty years of age and a little girl. Two leagues distant from home and in the middle of the night, he deems it as useless to procure the instruments, suitable for the performance of it, as to call in any of his brethren. He

operates with a bad razor and he preserves the mother, as he would also have preserved the child, if it had been alive at the time. In the second, which is undoubtedly still more extraordinary, the accoucheur opens the abdomen and the womb of a woman, whom he believes to be dead; he extracts the child and takes flight the moment the woman, who was only in a syncope, sends forth a sigh and complains of the injury done to her; and this operation is nevertheless followed by the success, which nature seems pleased to deny in most instances to the most wisely combined efforts of art, as if she were afraid to share the glory of it with men, who would seem better entitled than the others to attribute the success to themselves.

One of these facts has been communicated to us by M. Poumel, surgeon at Moissac, in the department of Lot; the other is given in a small work, entitled *Essai sur les accouchemens*, published in the 5th year, by M. Bodin surgeon and member of the legislative body. Here is an extract from these observations.

Third Case. On the 14th of ventôse year 6th (4th of March 1798), M. Poumel was sent for to deliver the wife of Arnaud Géraud,

a labourer at Ste. Thécle, who had been in labour several days. This woman, says he, was ill formed, rather lame and a little hunch-backed, in other respects tolerably strong. The labia pudendi and nymphæ were tumefied and painful to the touch: The belly was beginning to swell. The head of the fœtus was wedged in the upper aperture of the pelvis and one of the arms was engaged along with it. Seeing her, adds he, in imminent danger, from which she could only escape by a speedy delivery, and convinced that there would be as much difficulty in delivering her by means of the forceps as inhumanity in employing the crotchet, if the infant were still alive as he supposed it to be, he determined to perform the cesarean operation.

Being two leagues from home, in the middle of a forest, and in the night, he thought it unnecessary to send for suitable instruments and surgeons to assist him in the operation. A bad razor, the poor woman's husband and another man, who took flight on the first cries of the patient, a woman eighty years of age and a little girl appeared to him capable of supplying every requisite.

He made the incision in the middle of the abdomen, extending it to an equal distance above and below the umbilicus; this part appearing to him preferable to every other. He opened the womb in the same way and, after extracting the child and placenta, he made several stitches, which, according to the woman's account, were much more painful than the principal operation. The child was dead. M. Poumel gives no particulars of the accidents, that followed the operation, or of the means employed to combat them: He remarks only, that the cure was completed in less than two months and that in Fructidor following the woman believed herself pregnant again. This case is attested by some professional men, who saw the patient on the day after the operation and attended to the treatment, as well as by some other persons.

In communicating it to the Society, I have no intention of justifying the conduct of the operator: Perhaps I should have no more reason to blame it, although the inutility of the cesarean operation appears to me more clearly demonstrated in this observation than its indispensable necessity. The success,

which followed this operation, appears to me much less astonishing than the boldness of the surgeon, who dared to run the risk of having the sole charge of an event, which is but seldom so fortunate.

Fourth Case.—Gauthier, of the village of La Janverie, commune of Montaut, department of Loir-and-Cher, being at her full time and in labour, fell into such a state, that Penard, a surgeon at Cangey, believing her to be dead, opened her belly and womb with a razor, to save the life of the child. Terrified by a sigh, which the woman fetched, and some words, which she articulated distinctly, at the time he was endeavouring to push a needle into one of the margins of the wound, to make a stitch with the sole view of keeping the intestines in the belly, he took flight and did not return to the patient till he had been repeatedly desired to come and sew her up again. The brother of Penard, a surgeon at Limeray, conducted the after-treatment so fortunately, that this woman was still living in September 1792. She had suffered no other consequences from the operation except a ventral hernia, which had served her as a pretext for bringing an action against Penard, because, said she, he

ought to have sewed her up with needles of a particular kind, instead of common needles. M. Bodin adds, that the proceedings in this action may be still found at Onzain(1).

Fifth Case. Mr. ——, officer of health at Epinal, department of Vosges, has just informed me, that he performed the cesarean operation, in the course of the 6th year, upon a singularly deformed woman, three feet and a few inches in height and covered with an inveterate eruption. She had been in labour 36 hours and her pelvis was at most only two inches in diameter, according to the estimate which he and five of his brethren, called in consultation, had made of it. He practised this operation in the linea alba and the placenta, as in one of the preceding cases, was found in the course of the incision. Two stitches of the quilled suture were made. The mother died in the night betwixt the third and fourth day after the operation; but the child, which was very strong at its birth, is at this day in good health.

(1) Essai sur les accouchemens, page 135.

APPENDIX.

BY

J. HULL, M. D.

" Puissent ces réflexions faire sentir aux médecins combien les sciences physiques, trop souvent regardées comme de simples accessoires de la science médicale, peuvent un jour devenir importantes! combien il est nécessaire pour eux d' en étudier & d' en suivre le marche; parceque c' est par leur secours & surtout par les progrès de l' analyse animale, qui se perfectionne de jour en jour, que bientôt peut-être on verra diminuer & l' incertitude d' un grand nombre de nos moyens & franchement, disons-le, la trop fréquente ambiguité de nos conjectures !"

Halle Annales de Chimie. T. 18. p. 137.

APPENDIX.

BEING desirous of laying before the public an account of all the cases, that have come to my knowledge, in which the Cesarean Section has been performed successfully or unsuccessfully, I shall here adduce two of the latter description, that have occurred in Great Britain, since I wrote my Second Letter to Mr. Simmons. To these I shall subjoin an account of three cases, that have happened in Manchester and its vicinity within the last thirteen months, in which, the attempts to deliver the women *per vaginam* proving fruitless, they and their infants all perished.

SECTION I.

UNSUCCESSFUL CASES OF THE CESAREAN OPERATION.

Case I.

This operation was performed, in March 1800, by Mr. John Bell, Surgeon in Edinburgh and Author of two valuable works on Anatomy and Surgery. The child was pre-

served: But the mother expired in about an hour after her delivery. Mr. Bell attributes her death to an internal hemorrhagy.

Whilst I regret, that I cannot state, whether this was a case of Malacosteon, or indeed any further circumstances relative to it, I am happy in being enabled to give a very full and satisfactory history of the next case. It was communicated to me by Mr. Walter Dunlop, an ingenious surgeon at Rochdale in this county, who performed the operation.

Case II.

" Susan Holt, the subject of this case, was in the thirty-sixth year of her age and resided at Lower Shone, about three miles from Rochdale. She was married, when about nineteen, and has been the mother of ten children, all of which she carried to the full time. Soon after her first labour, about fifteen years ago, she began to complain of pains in her shoulders, which she attributed to Rheumatism. These continued to harass her until her second pregnancy, when they fixed in her back, loins and hips, and proved a source of great uneasiness to her for three years: Her walking

then became impeded and continued to be attended with very great pain for about four years more. During the latter part of this period an evident distortion of the bones took place in different parts of her body and was accompanied with a general wasting of her flesh and diminution of stature. In seven years more the lameness and emaciation had increased to such a degree, that her person exhibited a sad spectacle of the ravages of Malacosteon."

" She was delivered of her first five children without any difficulty by a midwife. In her sixth labour she was also attended by a midwife: The child presented with the feet and the body was brought down without much difficulty; but the head remained unextracted, in spite of all the endeavours of the midwife, for almost a whole day, which deterred the poor woman from trusting herself into the hands of her midwife any more."

" About six years ago I was called to attend her in her seventh labour, when she appeared much emaciated and had been unable to walk for three months without excruciating pains: Upon examination I found such a degree of deformity in the bones of the pel-

vis, as forced me to send for the perforator and crotchet, which enabled me to accomplish her delivery, but not without a deal of hard work. Her recovery was painful and tedious."

" In about eighteen months after, she had occasion for my assistance again. The distortion of the pelvis had increased, which necessarily rendered this delivery more tedious and difficult than the last: However it was effected by performing Embryulcia as before. The most troublesome circumstance, that supervened to this parturition, was a *prolapsus uteri*."

" At the end of twelve months more I found her in labour of her ninth child, the third and last time that the capacity of her pelvis would admit of embryulcia being employed. The head of the child lay so high above the brim of the pelvis, which was now extremely contracted at the superior aperture and was likewise so much diminished at the inferior aperture by the approximation of the rami of the ossa ischia, that the perforation of the cranium was attended with the greatest difficulty. After diminishing the volume of the head as much as possible, the exertion made to bring it

through the pelvis was so great and so long continued, that the poor woman became insensible. I now began to be alarmed for the fate of my patient, but rather than abandon her in this perilous situation and leave her half-delivered, I resolved to continue my exertions, which at length overcame the obstacles to her delivery. As usual she had a very tedious recovery."

"Her husband now saw the dangerous effects of cohabiting with his wife, in consequence of her infirm and deformed state, and resolved upon a separation; which however did not continue long: for in less than two years I was sent for to attend her in her tenth labour. This was on *Tuesday*, the 3d of February 1801. I reached her house about five o'clock in the evening and upon enquiry learned, that she was at her full period of utero-gestation and had been taken in labour on Sunday the 1st of that month, about two o'clock in the afternoon. Her pains continued more or less severe until two o'clock on Tuesday morning, when the membranes broke and a considerable quantity of liquor amnii was discharged during the following pains, which increased in frequency and force, until I visited her."

" On examination per vaginam the os tincæ was found dilated to the size of a crown-piece, and the position of the child ascertained to be preternatural. The presenting part, I believe, was a foot. Since her last delivery the distortion of the pelvis seemed to have made a most rapid progress. The branches of the ossa ischia now approached so near to each other, that a finger could not be introduced betwixt them. The superior aperture could only be reached by pressing back the perinæum and introducing my fingers behind the tuberosities of the ossa ischia, which were very near to each other. This aperture was very much diminished in capacity from the great projection of the os sacrum and lumbar vertebræ: As near as I could judge from attentive and repeated examinations, the distance from the os sacrum to the ossa pubis did not exceed one inch and a half, and the whole of the pelvis seemed nearly as narrow as that of Elizabeth Thompson. Such indeed was the general distortion of the pelvis, that it rendered the introduction of a hand, in order to bring down the feet of the child, altogether impossible: And provided the head had been the presenting part, it would have been a

nice and arduous task to have conducted the perforator with safety to it."

" I was now fully convinced, that art could not interpose to save the life of the child, or give the mother a chance of recovery, in any other way than by performing the cesarean section. I therefore informed the poor woman, that it was requisite for me to go home in order to bring what was necessary for assisting her delivery; which she agreed to, begging that my stay might be as short as possible, because she found herself unable to exist long in her present situation."

" Sensible of the danger, that would arise from any further delay, I returned prepared to perform the operation. Her pains had been as frequent and severe during my absence as before; but had produced no farther dilatation of the os tincæ, or alteration of the presenting part. I now informed the poor woman, that the child lay quite out of my reach, and that it was impracticable to deliver her by the natural passage, and intimated to her, that there was another method of delivery, by which alone she and her infant might have a chance for their lives. I explained to her the nature and consequences of this operation, observing at the same time,

that the hour of her dissolution was certainly near, if it were not performed. On hearing these suggestions she readily consented to any operation, that I deemed proper for her relief."

" The mother thought her child was alive, although its motions had been rather obscure since the labour-pains became strong: And I had reason to believe her three last children were living, when embryulcia was performed."

" The state of the rectum and bladder was favourable to the operation, the former having been emptied once and the latter several times, spontaneously, in the course of the day."

" The necessary preparations being made, the operation was begun about ten o'clock in the evening, with the assistance only of an old midwife and three other female attendants. I have to regret the want of my brother's advice and assistance, on this important occasion, who was confined by a Typhus, caught when attending to the duties of his profession."

" Having my patient placed upon a sofa in as convenient a position for the operation as possible, I began the external incision two

inches below and on the right side of the umbilicus and carried it upwards in an oblique direction to the left side, making an opening through the skin, muscles and peritonæum, six inches in length, upon the most prominent part of the abdomen and immediately over the head of the child, which could be distinctly felt, from the thinness of the abdominal parietes. The uterus appearing fully in view, an incision was made upon the body of this viscus and brought up to the fundus in a less oblique direction than the external wound. Seizing the child by the head and arms, I readily extracted it, and having tied the funis umbilicalis I removed it. The placenta followed with the greatest ease and expedition. The intestines now began to protrude very much and it required so much care and attention to return and support them, that I had not an opportunity of examining the internal state of the uterus, which I only squeezed gently, trusting, from the dilatation of the os tincæ, that the effused blood would find its way per vaginam. The lips of the external wound were brought into contact by a number of ligatures, inserted near each other, but not passed through the peritonæum. Proper dressings being then

applied and secured by a moderately tight bandage, she was carried to bed having suffered less pain than in her three last labours. She bore the operation with astonishing fortitude and made but little complaint. She had a propensity to vomit but did not bring up any thing: Her pulse was frequent and rather small, in other respects the operation seemed to produce no violent shock upon the constitution and I ordered nothing but a strict antiphlogistic regimen to be observed. The hemorrhagy, that occurred during the first part of the operation, was not of the smallest consequence; but during the second it was more considerable, from the lower part of the incision into the uterus falling upon the placenta; yet, as near as I could judge, the quantity of blood lost did not exceed eight or nine ounces."

"The child did not cry, when first brought into the world; but, before I had finished the operation, I was cheered by its strong and reiterated cries."

"About two hours after the operation the woman became more sick and vomited; she afterwards passed a tolerable night and had some sleep."

"On *Wednesday*, the 4th of February,

about eight o'clock in the morning, she began to complain of pain in the abdomen and the vomiting returned; and, as she had not had any evacuation either by stool or urine since the operation, a clyster was immediately given, but without effect. In the afternoon I visited her and found considerable tension over the abdomen, with pain on pressure and vomiting at intervals. She had no headach. Her heat natural: Thirst troublesome: Pulse 130 and body still bound. Hitherto there had been no lochial discharge per vaginam. I ordered the clyster to be repeated, warm fomentations to the abdomen and some pills with calomel to be taken every three hours, until the bowels should be freely emptied. A saline Julep was likewise prescribed to allay the vomiting."

"On *Thursday*, the 5th, she appeared pretty cheerful and had passed a good night: The pain of the abdomen was much relieved by the warm fomentations: She had made water twice, but had not had a stool. She was ordered to adhere to her antiphlogistic plan of regimen: An ounce of Castor-Oil was given instead of the calomel pills, which had not been taken as prescribed. The oil being returned by vomiting, a purgative

clyster was ordered to be thrown up in the afternoon and, if it failed to procure a stool, the calomel pills were to be repeated."

" On *Friday*, the 6th, she had experienced great relief from three copious loose stools, which she had passed this morning. The tumefaction of the abdomen was subsided and she could bear it to be pressed without pain. Her vomiting less urgent: Tongue dry and furred: Thirst troublesome: Heat natural: Pulse 130 and feeble. There had been a moderate discharge of blood per vaginam. The dressings were removed from the wound, which had a healthy appearance, and its lips were in perfect contact."

" On *Saturday* afternoon, the 7th, I was informed, that she had had a good night and no return of the vomiting for twenty-four hours. She had eat a little several times in the day and was confident she should recover. The attendants, finding her so well and cheerful, had thought fit to remove her from the bed, until it was adjusted, and she bore this without inconvenience."

" I likewise learned, that in the absence of her husband she got out of bed this evening, with the assistance only of two of her children, and drank some cold beer."

" *Sunday*, the 8th. Having occasion to meet in consultation Charles White Esq. from Manchester, who has long been considered as one of the first practitioners of the age and, finding him inclined to visit my cesarean patient, I gladly conducted him to her place of abode."

" We found she had passed a good night: The vomiting had entirely ceased and her bowels were regular. The discharge per vaginam continued in small quantity. The pulse was 120 and the tongue had assumed a moist and clean appearance: Her thirst was considerably diminished and her appetite began to return. She had taken water porridge and milk to breakfast and broth with bread at noon. Notwithstanding all these favourable circumstances, upon removing the dressings from the wound, we found that its edges had assumed a puffy and slightly gangrenous appearance and that they were separated in the middle, owing to two ligatures having given way. To arrest the progress of the gangrene Mr. White recommended Musk and Volatile Alkali and believed, if this could be accomplished, that there was no other attending symptom, which could interfere with the poor woman's recovery."

On *Monday*, the 9th, Dr. Hull, having been called over to Rochdale to see a patient, visited Susan Holt with me about three in the afternoon. She was now greatly changed for the worse her situation being almost hopeless. She had been seized in the course of the forenoon with violent fits of cramp, to which she had been very subject in her four last pregnancies. These spasms now affected not only the superior and inferior extremities, but also the stomach, occasioning very great difficulty of breathing. Her pulse was 140 and very feeble: Her countenance paler than usual and contracted. The abdomen was more tumefied and on examining the wound, we found its lips gangrenous, considerably more open and discharging a thin sanious matter. As she could not take Musk and Volatile Alkali, in the form prescribed, a decoction of Peruvian Bark with Spir. Am. Comp. and Tinct. Opii was given instead thereof."

" She declared to Mr. White and Dr. Hull, at their respective visits, that she had suffered less from the cesarean operation than from any of her three deliveries, which were effected by Embryulcia."

" *Tuesday*, the 10th. I did not see her again, but afterwards learnt that she spent a restless night from repeated attacks of the spasms and died this morning, having been sensible to the last."

" I informed her husband, that the preservation of the pelvis would be of great importance to the medical world on account of its unusual distortion, and earnestly requested to inspect the abdomen, but I could not obtain leave."

" The spine was extremely curved forwards and the trunk, in consequence, was so much shortened, that the false ribs were sunk below the cristæ of the ossa ilia. For about eleven or twelve weeks before she underwent the cesarean section she had been carried to and from bed."

" By desire of the mother the child was baptized and named *Patience*, on the day after its birth. The last time I saw the little Cæsonian, which was on the 9th of February, she was likely to be reared with proper care: But I have since learned, that she died when only a fortnight old."

REMARKS.

Upon the former Case I have only one observation to offer, namely, that the cesarean section has been so rarely attended with, or succeeded by, a violent hemorrhage, that this is the only instance, in which I find the death of the patient ascribed to this cause, notwithstanding it constituted the grand objection of the earlier adversaries of this operation (1).

The latter Case furnishes an additional instance of the inability of the human body, when affected with an extreme degree of Malacosteon, to withstand the shock of the cesarean operation and repair the injury done by it alone, or by it and the pains of labour, taken jointly.

The number of fatal cases of this kind, that have been recorded and collected, is now so great as almost to preclude every hope of preserving the life of a mother, affected with Malacosteon, by the cesarean

(1) See an account of the sources of danger from the cesarean operation in my *Second Letter*, p. 323—346.

operation. The lips of the external wound, though kept in the most perfect contact by means of sutures and adhesive plaisters, shew little, or no, disposition to heal by the first intention: And the effects of the inflammation, arising from the incomplete state of the abdominal cavity and the injured and exposed state of the viscera, cannot be long supported by these feeble and nearly exhausted systems.

Of the 18 women, upon whom the cesarean section has been performed unsuccessfully in Great Britain, *seven*, at least, are ascertained to have been in an advanced stage of malacosteon; *five* were highly endangered by the long continuance of labour or injuries sustained previously to the operation; *one* appears to have been in a favourable state; and of the situation of the remaining *five* we cannot form any accurate judgment, for want of more detailed accounts ([1]).

From this view of the state of the British patients, upon whom the operation has been unsuccessfully performed, we are enabled to account satisfactorily for its great fatality

([1]) See my First Letter to Simmons, p. 69 & 70.

here. But it would be unfair to estimate the chance of a patient's surviving the cesarean operation from the experience of this island. *We* have recourse to it only as an operation of necessity, where we can neither accomplish the delivery by diminishing the bulk of of the child, nor by any other means. The practitioners of France and other states on the Continent of Europe perform it not only as an operation of necessity, but as an operation of election, where the mother may confessedly be delivered with considerable safety, by sacrificing the life of the child: It would appear also, that in general they have recourse to the operation, before the patient has suffered very much from the continuance of labour. Upon these grounds only, I apprehend, is the greater success of the continental compared with that of the British surgeons to be accounted for. Their experience, however, considered in the aggregate presents the proportion of successful and unsuccessful cases of the cesarean operation, when performed both as an operation of necessity and of election: And, before we can determine the proportion of cases, in which this operation itself does necessarily prove fatal, those patients must be deducted,

who were in an advanced stage of malacosteon, and who were debilitated, or otherwise injured in any material degree, previously to the performance of it. By making an estimate in this way and in this way only can we determine, how far the death of a patient is to be attributed to the operation, to previous disease or injury, or to these circumstances taken collectively. It may be further remarked, that the result of this practice in Great Britain presents rather an unfavourable view of the success to be expected from the cesarean section, performed as an operation of necessity; inasmuch as it was too long delayed in some of the ricketty women. For the same reason the result of the practice on the continent presents rather an unfavourable view of what may be expected from it, when resorted to as an operation both of election and necessity: And it may be expected, not without reason, when the propriety and necessity of this operation are universally admitted and when surgeons proceed to the performance of it in the early stage of labour, that a greater proportion both of parents and children will be preserved than has been hitherto done — the great object, which I have had in view in

bestowing so much time and attention upon the consideration of the cesarean section.

SECTION II.

THREE CASES IN WHICH THE MOTHERS DIED UNDELIVERED AND THEIR INFANTS PERISHED WITH THEM.

Melancholy as the two cases, just related, may appear, I have now to record three of a still more afflicting nature, in all of which the distortion of the pelvis was occasioned by Malacosteon. They have all occurred in this neighbourhood, since I wrote my Observations on Mr. Simmons's Detection &c, and with the cases, already published by me and some others, which I have heard of, too clearly evince, that this affection of the bones, as far as the pelvis is concerned, is no very uncommon occurrence. They also create a suspicion in my mind, that many similar cases have been met with, of which no public notice has been given by the attendant practitioners, and consequently, that numerous instances remain to be recorded, wherein the pelvis was too much contracted to admit of delivery by the crotchet, or by any other means than hysterotomy.

The first Case was communicated to me by Mr. W. Barlow; for the second I am indebted to Mr. Walter Dunlop of Rochdale; and in the third I was personally concerned.

Case I.

" Jane Kinnerley of Water-street, Manchester, aged 35, began to be in labour of her eighth child on Sunday, the 16th of March 1800."

" Her former labours had been easy and in general very quick. In her lyings-in she had recovered well, having never been subject to any material complaint, and her health, in short, had always been very good until the beginning of this pregnancy. Betwixt the 3d and 4th month she was much afflicted with pain about her loins and hips, which she attributed to Rheumatism. She soon became very lame, and from this time could never get out of bed without assistance."

" About eight in the evening of the day, above mentioned, she had some smart pains, by which the membranes were soon ruptured and a considerable quantity of water was discharged. After this the labour-pains immediately left her and she never felt the

child move afterwards. She began to complain of griping pain in the abdomen, and was troubled with vomiting and purging, but passed a tolerable night."

" She was attended by Mrs. Bradley, a midwife of the Lying-in Hospital, from the commencement of her labour, who examined her, but could neither reach any part of the child nor the os uteri."

" On Thursday, the 20th of March, one of the men-midwives of the charity visited her. There was a discharge of bloody water per vaginam: But she had experienced no return of labour-pains. She still complained, however, of gripings, had a troublesome diarrhæa and vomited very frequently a fluid of a reddish colour. She was much emaciated and debilitated and, on laying his hand upon the abdomen, he was much surprized to find the limbs of the child so distinctly perceptible through the parietes. He was thence at first led to suspect, that the fœtus was not in the womb; but, as the poor woman assured him, that her belly was not different to the touch from what it had been in her former pregnancies, and as the midwife, on being particularly questioned, declared there was nothing extraordinary to be perceived on an

examination per vaginam, he contented himself with directing some medicines for her. He visited her on the day following and found her nearly in the same situation."

" On Monday, March 24th, she was visited in the evening by Mr. Wood; who examined her, but could neither reach the fœtus, nor os uteri. Finding a considerable degree of deformity in the pelvis and that the patient was sinking very fast, he called a consultation of the accoucheurs of the Lying-in Hospital, and Mr. White and Mr. Hall met him soon after. The patient being now in a hopeless state and the child being believed to be dead, it was not thought prudent to make any attempt to deliver her."

" The matter, which she brought up by vomiting, became coffee-coloured or blackish; she grew gradually weaker and expired about ten o'clock this evening."

" Her body was opened on the second day after her death and the child was found lying in the general cavity of the abdomen, envelopped in a thick layer of coagulable lymph. Its head was turned towards the upper part of the cavity and the nates to the pelvis with the back placed anteriorly. The cervix uteri

was ruptured anteriorly, and on the right side in a transverse direction, to the extent of about four inches. The placenta remained in the uterus, but was detached from it. Most of the abdominal viscera appeared highly inflamed."

" The dimensions of the pelvis were not accurately taken, but as far as I can judge from having seen it and measured it with my fingers, it was more contracted at the superior aperture than the pelvis of Ellen Gyte (see Plate I.) and there was a sharp bony process on the body of the right os pubis and part of the right os ilium, near the linea innominata: The inferior aperture was not nearly so contracted as that of Ellen Gyte's pelvis (see Plate II), as it would admit of the introduction of my hand without much difficulty."

Case II.

" On the 28th of August 1800 I was requested to attend Sarah Fletcher, a poor woman aged 35, in Marland Work-house, about two miles from Rochdale. I saw her at six o'clock in the morning and learnt she had been in pretty strong labour for twelve hours."

" Upon examination per vaginam, I found the pelvis extremely distorted: The superior aperture was fully as much contracted as that of Susan Holt, upon whom I performed the cesarean section; but there was more space in the inferior aperture. The os uteri was but little dilated and the presentation of the child could not be distinctly perceived. However, after some time the membranes broke and upon a second examination I was satisfied, that it was a breech-presentation. The meconium was afterwards discharged with the pains, which became weaker and less frequent."

" I now endeavoured to introduce my hand per vaginam in order to lay hold of the child; but the dimensions of the pelvis were so much diminished, that I found this impossible and was glad to desist."

" Finding the poor woman's strength beginning to fail, I made a second effort with the blunt hook, which was fixed with great difficulty. However, notwithstanding all my exertions the presenting part could not be brought lower than the brim of the pelvis."

" Every attempt to accomplish her delivery proving fruitless, I contented myself with giving cordials to support her strength and

anodynes to mitigate her pains. She continued to sink rapidly and was seized with convulsions about four o'clock in the afternoon, which soon proved fatal."

" In tracing the history of her complaints I was informed she had enjoyed a good state of health, previously to her marriage, which took place when she was twenty-four years of age. In the course of five years she was the mother of three children: She had natural labours and was delivered by a midwife."

" When pregnant of her third child, she began to complain of pains in her back, loins and hips, which occasioned lameness. After her delivery these complaints kept gradually increasing and she became so weak about the pelvic region, that a false step threw her upon the ground with great violence. After lingering in this miserable situation for about three years, she at length lost almost all power of motion in her lower extremities: The remaining four years of her life were spent either in bed, or in a sitting posture."

" She complained of no pain but in the pelvic region, yet the spine was very much distorted and the sternum projected considerably. Her stature was greatly diminished

and she was much emaciated. During her fourth and last pregnancy the lower extremities broke into ulcers and became edematose."

"Previously to her last pregnancy, her husband had enlisted for a soldier and, after an absence of six years, had paid her a visit on a furlough."

"The body was not examined after death."

Case III.

Ellen Gyte of Ashton-under-Lyne was married at the age of 23 and was delivered of her first child in her 24th year. She bore her second child before she was 25: In this pregnancy she began to be afflicted with pains especially about her hips and loins, which were supposed to be rheumatic: After the birth of her child she grew very lame, insomuch that she was obliged to walk upon crutches for about two years and to be carried to and from bed. Two years and a quarter afterwards, when she was in her 28th year, she was delivered of her third child. She now began to take a table-spoonful of ling liver oil every night in a tea-cupful of warm ale and her body was rubbed all over

with it once a week. During the first six months she derived no sensible benefit from this plan; but by persisting in it for nearly half a year longer her pains went off and never returned, except from taking cold; she became able to walk without assistance and never afterwards had occasion to use either crutches, or a stick. In short she considered herself as cured by this remedy. She went to her full time of these three children and suckled the two latter. She formerly resided at Castleton in Derbyshire, but had removed from thence five years before her death.

Being arrived at the full time, in her fourth pregnancy, she was attacked with slight labour-pains on Friday, the 5th of December 1800. She was now in the 35th year of her age and her health had of late been good; except sickness in the first months, she had experienced scarcely any complaints.

On Saturday, December 6th, Mr. Southam, who then lived with Mr. Ridgway, was called to her assistance about one o'clock in the morning. He examined her soon after, but being unable to reach the child and having ascertained, that the pelvis was extremely de-

formed, he returned home and informed Mr. R. of these circumstances.

About ten the same morning the membranes broke; Mr. Ridgway and Mr. Southam visited her soon after and found the os uteri dilated to about the size of a half-crown. They could not however reach any part of the child. Mr. S. visited her very frequently in the course of this day and he believes Mr. R. saw her twice.

Mr. Southam was called up to her the night following. The os uteri gradually dilated and he first discovered the presentation of the child to be the head about ten o'clock on Sunday morning.

About eleven in the forenoon of the same day Mr. Ridgway consulted with two of his professional brethren upon the case. They did not exactly agree respecting the dimensions of the pelvis. Mr. R. thought there was a space equal to two inches from the fore to the back part of the pelvis at the superior aperture; one of the other gentlemen thought the distance only about one inch. The use of the perforator and crotchet was proposed; but Mr. Ridgway doubted, whether the delivery could be accomplished by these instruments, and therefore did not

proceed to perforate the child's head, though he believes this might have been done with safety at that time. He recollected the difficulty, that he and Mr. Hall had experienced in delivering Elizabeth Thompson (upon whom the cesarean operation was performed in her next labour in the Lying-in Hospital at Manchester) with the crotchet, and he was certain that her pelvis was not at that time nearly so contracted.

On Sunday night, about eleven o'clock, Mr. Southam brought me a letter from Mr. Ridgway, stating that he had an uncommon case in midwifery and requesting my assistance. I went over to Ashton, as soon as I could, and, after conversing with Mr. Ridgway upon the case, we visited the poor woman. It was then near two o'clock on Monday morning.

She appeared to me to be in a dangerous situation: Her countenance was changed, her strength diminished, her pulse small and frequent, her tongue furred and her abdomen sore and tender. She had vomited on the Saturday and had had several loose stools on the preceding day. She had not made water regularly, but this had been constantly forced away by the labour-pains, so that she did not

complain of either inability or propensity to pass her urine.

On examining her per vaginam, I found the os uteri fully dilated and the head of the fœtus presenting: No part of the cranium was then forced into the superior aperture of the pelvis; but a considerable portion of the scalp had descended into the tube, or cavity of the pelvis. This circumstance, added to the extreme narrowness of the inferior aperture, which rendered it impossible for me to introduce my hand, made it extremely difficult to measure the superior aperture of the pelvis with precision; but I was able to satisfy myself that the diameter, taken from the fore to the back part in the directions B C B D Plate 1st, measured about two inches as Mr. Ridgway supposed, and that the distance from the base of the os sacrum to the symphysis pubis was about an inch more.

From the feel of the scalp and from the circumstance of the meconium's having been forced away early in the labour, I had little doubt but the child had been dead for some time, although the mother thought she had felt it move briskly about three o'clock on Sunday afternoon.

In the consultation, which I held soon afterwards with Mr. Ridgway and Mr. Winterbottom, I intimated that there was little, if any chance of saving the woman by any means whatever; that I believed the child to be dead and that I thought the most eligible practice would be to attempt the delivery by the perforator and crotchet. After a long deliberation we agreed to adopt this plan and about four o'clock that morning, I perforated the head at Mr. Ridgway's request, broke down the texture of the encephalon and scooped it away by means of a spoon and blunt hook. This part of the operation was performed without any material difficulty, the os uteri being fully dilated and the labour-pains sufficiently forcible to keep the head of the child fixed upon the superior aperture. I then returned to Manchester, desiring to be informed, if they should find it impossible to extract the child by the crotchet.

About seven in the evening I received a Note from Mr. Ridgway, acquainting me, that the poor woman was not delivered and that the appearances were very unfavourable. Upon this I immediately went over to Ashton and on my arrival there about nine o'clock, Mr. R. informed me, that the attempts to de-

liver with the crotchet had not succeeded and that the case was hopeless. I soon afterwards met him, Mr. Winterbottom, Mr. Ogden and Mr. Cock at the patient's house. She was then sitting up in a chair and evidently in a state, that precluded all hope of relieving her. Her face was pale and contracted: Her respiration laborious: Her pulse very small and 160 in a minute: She had thrown up a coffee-coloured fluid: Her labour-pains had ceased; but she complained of a fixed pain and soreness of the abdomen: She had a discharge of blood per vaginam and had lost in this way a pound of blood or more. I did not examine her at this visit, nor did any of the other gentlemen. Mr. Winterbottom had examined her about seven o'clock in the evening, and found a portion of the scalp low down in the pelvis and also a large piece of the cranium, which he tried to pull away with his fingers, but not being able to effect it in this way, he did not think it prudent to have recourse to the crotchet; She was not examined by any of the gentlemen afterwards.

In about a quarter of an hour, after I left the room, she died: And, leave having been

obtained to inspect the body, I went over to Ashton the day following and opened the abdomen about five o'clock in the evening, in the presence of Messrs. Ridgway, Winterbottom, Ogden, Cock and Southam.

APPEARANCES ON DISSECTION.

The abdomen was much distended and extremely prominent. On cutting into its cavity a very considerable quantity of gas was discharged and a few ounces of coagulated blood and serum were observed.

The fœtus was found lying in the general cavity of the abdomen, with its head under the false ribs on the left side and the nates to the pubes with one foot in the superior aperture of the pelvis.

The uterus was of the size of a child's head and lay partly behind the fœtus, with the fundus rather more inclined to the right side of the woman. Externally it was in a high state of inflammation, especially at the fundus. Being removed with the whole of the vagina and a longitudinal incision being made through both anteriorly, the uterus was found to be about an inch thick near the fundus, which was the thickest part; and its substance was extremely red. On detaching

the placenta, which still adhered to the womb, a quantity of purulent matter was observed betwixt them, occupying a space of greater extent than a crown-piece. The laceration or rupture, through which the child had been expelled into the abdominal cavity, affected the vagina only, being situated about three inches below the os uteri: It was in a transverse direction, extending across the whole of the posterior part and a portion of the lateral parts of the vagina: On the left side the laceration extended perpendicularly upwards nearly to the os uteri; but the whole substance of the vagina was not here affected, the innermost coat remaining entire. The whole of the vagina was in a highly inflamed, or gangrenous state.

The tubæ fallopianæ were inflamed and gangrenous, whilst the ovaria were perfectly sound.

The peritoneal coat of the vesica urinaria was much inflamed: The internal mucous membrane appeared to be contused and that portion of it, which lined the urethra, was in a state of gangrene.

The texture of the rectum was so much injured, that it tore as easily as a piece of wet

paper, where it entered the upper aperture of the pelvis.

The peritonæum, as investing the cavity of the abdomen, was very much inflamed and all the abdominal viscera, except the liver and spleen, were in a state of high inflammation.

The thorax and head were not examined.

The spine appeared to be but little distorted, although her stature was considerably diminished. Her husband believes she was once five feet three inches high: She was measured after her death and found to be only four feet eight inches in height. Her stature diminished very rapidly indeed after the birth of her third child.

The bones of the pelvis seemed to possess their natural firmness and were not at all moveable at their anterior, or posterior symphyses. The right os innominatum was considerably more distorted than the left. The central parts of the alæ of both ossa ilia were transparent and extremely thin.

Dimensions of the Pelvis.

From the crista of one os ilium to the other, at their most distant points, the pelvis measured 10 inches—From the anterior-

superior spinous processes of one os ilium to the other $7\frac{1}{2}$ inches — From the anterior-inferior spinous processes of one os ilium to the other $5\frac{3}{4}$ inches — The perpendicular height from the apex to the base of the os sacrum was $1\frac{3}{4}$ inch; from the apex of the os sacrum to the top of the 5th lumbar vertebra $3\frac{1}{8}$ inches — The depth of the pelvis laterally was $3\frac{1}{2}$ inches on the left side and $3\frac{1}{8}$ inches on the right side—The depth anteriorly, from the upper to the under margin of the symphysis pubis, was $1\frac{1}{2}$ inch; from the tuberosity of the left os ischium to the under margin of the symphysis pubis, the perpendicular height was $3\frac{1}{4}$ inches; from the tuberosity of the right os ischium to the under margin of the symphysis pubis $2\frac{3}{4}$ inches—The breadth of the os sacrum was $4\frac{3}{10}$ inches.

Superior aperture, see Plate 1st. From the symphysis pubis to the juncture of the 4th and 5th lumbar vertebræ, A B, $3\frac{1}{3}$ inches; to the base of the os sacrum $3\frac{1}{2}$ inches—From the linea innominata of one os ilium to the other, at their most distant points, C D, $4\frac{3}{4}$ inches—From the angle, formed by the curvature of the os pubis, to the juncture of the 4th and 5th lumbar vertebræ,

E B, being the widest part on the right side, $1\frac{7}{8}$ inch: From the same to the same, F B, being the widest part on the left side, $2\frac{1}{4}$ inches—From the anterior to the posterior part of the pelvis, being the narrowest point on the right side, G H, $1\frac{3}{8}$ inch; from before to behind, being the narrowest part of the left side, J K, $1\frac{7}{8}$ inch—From the right sacro-iliac symphysis to the angle of the left os pubis, L F, $4\frac{1}{4}$ inches; to the symphysis pubis, L A, $5\frac{1}{8}$ inches—From the left posterior symphysis to the angle of the right os pubis, M E, $3\frac{1}{2}$ inches; to the symphysis pubis $4\frac{3}{4}$ inches—From the body of the right os pubis to the left, in the direction N F, $\frac{1}{4}$ an inch—The diameter of the largest circle, that could be formed in the superior aperture, was $2\frac{1}{10}$ inches—The space, included by the dotted line on the left side, is equal to the greatest space in Elizabeth Sherwood's pelvis, as this has been stated by Dr. Osborn.

Inferior Aperture, see Plate 2d. From the apex of the os coccygis to the inferior margin of the symphysis pubis, A B, $3\frac{1}{2}$ inches—From the spinous process of one os ischium to the other, C D, nearly $2\frac{5}{8}$ inches—From the spinous process of the left os

ischium to the extremity of the os coccygis, C A, 1 inch: From the spinous process of the right os ischium to the apex of the os coccygis, D A, $1\frac{3}{16}$ inch—From the tuberosity of the os ischium to the sacro-iliac symphysis, on the right side, $4\frac{1}{16}$ inches; on the left side 4 inches—From the tuberosity of the left os ischium to the apex of the os coccygis, E A, 2 inches: From the tuberosity of the right os ischium to the apex of the os coccygis, F A, $2\frac{1}{4}$ inches—From the tuberosity of one os ischium to the other, at their nearest points, a b, nearly 1 inch—From the ramus of one os ischium to the other, at the narrowest part, G H, $\frac{3}{8}$ of an inch—From the ramus of one os pubis to the other, at the widest part, I J, $\frac{3}{4}$ of an inch—From the most distant part of the os sacrum to the symphysis pubis, namely, in the middle of the tubular part of the pelvis, 6 inches.

Dimensions of the Fœtus.

The fœtus was a male, of the full size, excessively putrid and emphysematous. It measured $21\frac{1}{2}$ inches in length and the thorax was 13 inches in circumference under the

arms. From the external canthus of one orbit to that of the other it measured $2\frac{5}{8}$ inches—From the point of the chin to the top of the nose, on a level with the upper margin of the orbits, $1\frac{7}{8}$ inch.

After removing the remainder of the parietal bones and part of the frontal and occipital, the base of the cranium, which was considerably softened and broken, passed without difficulty through the pelvis, when divested of the vagina, rectum and other parts, diminishing its capacity.

The weight of the fœtus was not ascertained.

REMARKS.

The case of Kinnerley leads me to make the following observations.

1st. The progress of the disease of her bones was unusually rapid. It does not appear to have taken place till her last pregnancy and in a few months it had deprived her of the power of walking without assistance. At the end of nine months her constitution was very much impaired and her pelvis for the time very much contracted.

2dly. The rupture or laceration of the womb does not seem to have produced any

immediate and alarming effects, insomuch that it is not easy to ascertain exactly when it took place; although there is reason to believe from the cessation of the labour pains and the attack of vomiting and purging with gripings, that it happened about the time when the membranes broke.

3dly. This case furnishes an additional proof of the irreparable injury, that may be done in a very short time by the pains of labour, where the pelvis is much distorted, and especially where the sharp bony ridge, or process, exists, of which Dr. Garthshore has taken notice (1).

4thly. As the child was found completely envelopped in coagulating lymph, it would appear that, if this poor woman's life could have been preserved for a sufficient length of time, the child would have been included in a distinct sac and might have been extracted through an ulceration, or incision of the abdominal parietes, without exposing any of the viscera.

In the case of Sarah Fletcher, the affection of the bones took place, when she was about

(1) See Medical Journal, Vol. 8th, or my Second Letter to Simmons, p. 210.

28 years of age, and in the space of seven years her pelvis was become so much distorted as to render delivery per vaginam impracticable. In Kinnerley the complaint came on at a later, in Gyte at an earlier age and I know a poor woman, in whom it came on before her 20th year.

It has frequently happened, that one or more labours, after the attack of malacosteon, have been easy and natural; that in one or more of the subsequent ones delivery has been practicable, by means of the perforator and crotchet, and that the patient has afterwards died of this disease independently on labour, or, having been taken in labour, has died undelivered, or soon after her delivery, whether this has been effected by hysterotomy or by the section of the symphysis pubis. A similar train of circumstances would, in all probability, have taken place in this poor woman, if her husband had not left her for so long a time; for it seems reasonable to expect, that she might have conceived several times in these six years, might have had one or more easy labours and might have been delivered once or oftener by the crotchet, before the capacity of her pelvis was so much

diminished as to render her delivery by this instrument impracticable.

Her condition was become so miserable and wretched, that she could not have been expected to live much longer than she did, if she had not been impregnated for the fourth time: And having arrived at the full period of utero-gestation, it seems to have been impossible to deliver her, whatever might have been the position of the fœtus, except by the cesarean operation, or the section of the symphysis pubis. Every professional man must, I think, be satisfied, that the life of this woman could not have been preserved by eithe of these means and therefore that the preference was due to the former, as more likely to have saved her child, if she could have been prevailed upon to submit to it at the commencement of her labour.

One circumstance in this case is too remarkable to be passed over unnoticed, namely, that she should have died in labour, in less than 22 hours. Great mischief, we know both from the preceding and other cases, may be done to the abdominal and pelvis viscera in a shorter period; but how far these viscera were injured in this instance, we have

no means of judging, as the body was not opened.

The 3d case is peculiarly interesting and I am induced to make several observations upon it.

1st. As Ellen Gyte had not been examined after the rupture of the vagina and consequent escape of the fœtus from the womb, it was a matter of great surprize to us all to find the child in the general cavity of the abdomen and its position completely reversed.—However as the head of the fœtus must have passed first through the lacerated wound, it must necessarily have ascended towards the superior part of the abdominal cavity, otherwise the trunk and inferior extremities could not have been excluded from the uterus.

2dly. It may appear singular at first sight, that the rupture of the vagina should have been situated so far below the os uteri as three inches; a circumstance, which, I apprehend, may be thus accounted for. The labour-pains being pretty strong, the uterus was enabled to expel the presenting part of the child through its orifice and to elongate the vagina in the same proportion, as its own cavity became shortened, because the head could not descend below, or even enter into

the superior aperture of the pelvis. The head continuing to be pressed against the parietes of the vagina, lining the superior aperture of the pelvis, whilst the vagina was forcibly pulled upwards by the contractions of the uterus during every pain, the texture of the former must have become materially injured, where it was in contact with this irregular bony ring, and at length forced to give way in this part.

3dly. The antero-posterior diameter of the superior aperture of this poor woman's pelvis was much greater than that, which Dr. Osborn has stated to be sufficient for admitting of delivery by the crotchet, with perfect safety to the mother, and yet it was found impracticable to deliver her with this instrument. It may be contended, however, that Ellen Gyte might have been delivered, and her life preserved by proceeding exactly in the manner recommended by Dr. Osborn, that is, by opening the head of the child at the beginning of the labour and deferring every attempt to extract it for thirty hours, that the body might be softened by putrefaction: But this I very much doubt. The head could not have been perforated with safety before Sunday morning about 10 o'clock (forty-six hours after the la-

bour commenced) and if it had been done at that time and the patient left to herself for 30 hours, every attempt to extract the child would of course have been deferred till two o'clock on Monday afternoon; at which time, in all probability, the woman's life would have been in as much danger as it was, when the attempt to deliver by the crotchet was made. And in the 2d place, the fœtus was in a state as favourable to extraction, admitting Dr. Osborn's own principle, when Mr. Ogden &c. began to use the crotchet, as if the perforation of the head had been made thirty hours before, the body being in such a highly putrid state as to leave no doubt of the child's death having taken place before 10 o'clock on Sunday morning. If therefore any advantage could have been gained in this case, from proceeding in the manner recommended by Dr. Osborn, it must have been derived from this circumstance solely, that the pressure on the vagina, rectum and bladder, would have been made by the evacuated fetal head, instead of the entire head, and it may be questioned, whether the pressure of the mutilated head would have done less mischief.

The difficulty of using the crotchet in this case was very much increased, from the contracted state of the inferior aperture and the depth of the pelvis anteriorly. Had the pelvis been more open in this part, I am of opinion that the fœtus might have been extracted by the crotchet, though not without doing considerable injury to the mother. The soft parts, lining the cavity of the pelvis, must necessarily be much contused by bringing down the head of the child, whenever there is so much irregularity and contraction at the superior aperture, as is found to exist in this pelvis.

4thly. As the termination of this case was as unfortunate as possible, it may be proper to enquire how an accoucheur should proceed to obtain more success, if he meet with a patient who has a pelvis similarly and equally distorted?

This question may be considered in three points of view.

1st. Where there is great reason to believe the fœtus to be alive.

2dly. Where the child is known, or with great reason believed, to be dead and the mother has not apparently sustained any material injury of the abdominal or pelvis viscera.

3dly. Where the child is believed to be dead and the parent is already in very considerable danger.

In the first of these supposed cases, I am decidedly of opinion, that hysterotomy should be practised, whatever may be the situation of the mother. For we are not justified, I think, in destroying a child in utero, without very good reason to believe, that we can by this mean preserve the life of the mother, and here, when we have destroyed the child, we are not certain, that we can accomplish the delivery by the crotchet, much less that we can save the life of the parent. Whereas, if the child be alive, when the cesarean section is performed, we shall almost to a certainty preserve it and may give the mother as good a chance by this operation as by the crotchet.

In the second case, it may be more difficult to determine, which of these two operations we should have recourse to. Hysterotomy will have this circumstance to recommend it, that the operator may be sure of effecting the delivery and may have some expectation of preserving the mother by it, where the constitution is not much impaired and the progress of Malacosteon appears to be stopped, as in the case of Ellen Gyte. Whilst consi-

derable doubts must exist in his mind, whether it be practicable to accomplish the delivery even by the perforator and crotchet. If, however, the latter mode should be adopted and prove insufficient, the section of the symphysis pubis might afterwards be resorted to and, though the pelvis be particularly contracted at the inferior aperture in the case under consideration, the tuberosities of the ossa ischia might perhaps be sufficiently separated to admit of the delivery of the woman, without tearing the posterior or sacro-iliac symphyses. It may be doubted, however, if embryulcia followed by the section of the symphysis pubis would not prove fatal to the mother in a greater proportion of instances than hysterotomy.

In the 3d case, the accoucheur can have no expectation of saving the child and can entertain but little hope of preserving the mother, either by hysterotomy, or the crotchet: But, since recoveries occasionally happen under circumstances almost hopeless, the delivery should, I think, be attempted. It was on this ground and because the dimensions of the superior aperture of the pelvis seemed sufficiently large to allow the passage of a moderate-sized fetal head, after

the reduction of its bulk by the crotchet, that I recommended an attempt to be made to deliver Ellen Gyte and the use of the perforator and crotchet in preference to hysterotomy: Although I could not venture to declare positively, that the delivery could be accomplished by means of those instruments. I wished the practicability, or impracticability of delivering her by the crotchet to be ascertained and it affords me some satisfaction, that Mr. Ogden, who is a declared opponent of the cesarean operation* and had recommended the use of the crotchet to Mr. Ridgway at the consultation, attempted to deliver her with it.

5thly. It appears from the case of Ellen Gyte, that the softness of the bones, affecting adults, is not an absolutely incurable disease. There is reason to believe, that if she had escaped impregnation, she would neither have died of Malacosteon, nor of its consequences. Hence I am encouraged to consider the cure &c, of this disease in the succeeding section.

* See Medical and Physical Journal, Vol. 2. p. 479.

SECTION III.

ON THE CAUSES, CURE AND PREVENTION OF MALACOSTEON.

Previously to entering upon the consideration of the remedies, likely to prove beneficial in this complaint, I shall take a view of the composition of bone, which has been of late fully ascertained by Mr. Hatchett's and M. Merat-Guillot's analyses.

In a valuable paper, entitled *Experiments and Observations on Shell and Bone*, published in the Philosophical Transactions for the year 1799, Part II, Art. 18, Mr. Hatchett has shewn, that the constituent parts of bone are cartilage or membrane, phosphate, carbonate and sulphate of lime. He has pointed out, that the phosphate of lime is in large and the carbonate and sulphate of lime in very small quantity: But he has not determined the exact proportions of each of these substances. This defect has been supplied by Merat-Guillot, in a paper printed in the 34th Vol. of the Annales de Chimie p. 68 &c. He has analysed the bones, shells, crusts &c, of different animals and given a very interesting table of the results; a translation of which I shall here adduce.

Names of the substances employed.	Proportions of Gelatine.	Proportions of Phosphate of Lime.	Proportions of Carbonate of Lime.	Loss.
Human Bones from a burial ground....	16	67	1.5	15.5
Dry human Bones that had not been buried	23	63	2	2 (12 ?)
Bone of an ox.....	3	93	2	2
..... a calf.....	25	54	trace	21
..... horse.....	9	67.5	1.25	22.25
Teeth of a horse.....	12	85.5	0.25	2.25
..... an elephant, *or* ivory.....	24	64	0.1	11.15
Bone of a sheep.....	16	70	0.5	13.5
..... an elk	1.5	90	1	7.5
Hart's horn.....	27	57.5	1	14.5
Bone of a hog	17	52	1	30
..... hare	9	85	1	5
..... chicken...	6	72	1.5	20.5
Egg shells.....	3	2	72	23
Bone of a pike	12	64	1	23
..... carp.....	6	45	0.5	48.5
..... viper	21.5	60.5	0.5	17.5
..... lobster	18	14	40	28
Mother of pearl.....	2.5	0	66	31.5
Crab's eyes.....	2	12	60	26
White coral	1.5	0	50	48.5
Red coral.....	0.5	0	53.5	46
Jointed coralline	7.5	0	49	43.5
Cuttlefish bone	8	0	68	24

It may be proper to observe, that Merat-Guillot always analysed 100 parts and that all the products, of which he has determined the quantities, were dried as much as possible—The loss sustained during the analysis of each of the substances, mentioned in the table, is presumed by the author to be water chiefly; but he thinks that a portion of gelatine was lost and there was a small quantity of saline matter, which he did not examine. He seems to have overlooked the minute quantity of sulphate of lime, which Mr. Hatchett's experiments have proved to be an ingredient of bone.

From the very different proportion of the phosphate of lime to the other ingredients in the bones of an ox and a calf, we may presume, that a similar disproportion obtains in the bones of man (and other animals) in the infantile and adult periods of life, consistently with perfect health: And we are assured, that a still greater defect of phosphate of lime takes place in human bones, in consequence of disease. In some very bad cases, both of ricketts (1) and malacosteon (2), the ossify-

(1) See Halleri Disput. ad Morb. Hist. &c. T. VI. p. 281. (2) See Gooch's Surgery Vol. II. p. 397 &c. and Bromfield's Surg. Vol. II.

ing substances have been almost entirely removed and the cartilaginous base even of the bones has in some instances been materially changed, so that they possessed much less firmness than sound bones, from which the earthy salts have been extracted by maceration in the acetous, nitric or muriatic acids. The bones of Mary Hayes, whose case is related in the 48th Vol. of the Phil. Trans., presented less resistance to the knife " than firm muscular flesh would have made, being changed into a kind of parenchymous substance, like soft dark-coloured liver, only meeting here and there with bony laminæ, thin as an egg shell," P. 300—And Mr. S. Bevan has given a very remarkable case of softness of the bones in an adult female, from which the following extract is taken: " Upon making incisions in her legs and arms, five or six inches long, I found the outer laminæ of the bones soft and become perfectly membranous, about the thickness of the peritonæum, containing (instead of a bony substance) a fluid of the consistence of honey when it is thick, of a reddish colour, not at all disagreeable to the smell: There was no appearance of any bones in her legs and arms, except near the joints, which

were in part dissolved and what remained were very soft and full of holes like a honey-comb: Also the bones of the head would easily give way to the pressure of the finger. It is remarkable, that those parts of the bones, that are the most compact and hard, were first dissolved, while their heads, which are more spongy and soft, had not so entirely lost their substance." *Phil. Trans. abr. Vol.* 9. p. 252.

The health of children, affected with Rachitis, has in innumerable instances been re-established and their bones have acquired the proper hardness and solidity, the curvature and deformity in some instances remaining and in others being corrected or removed: But that of adults, labouring under Malacosteon, has rarely been restored, at least where the disease has made much progress. The only instance that I know of, wherein the progress of this disease was effectually suspended, is the case of Ellen Gyte.

The cure of Rachitis has generally been effected by strengthening remedies, as nourishing food, free exposure to pure air, cold or tepid bathing, tonics &c: Oyster shells have also been strongly recommended in this complaint, in doses of a scruple or half a

drachm two or three times a day by De Haen; but the phosphate of lime, which is the principal ingredient of bone, has not, I believe, been exhibited till within these few years, with the view of supplying the system with ossific matter.

M. Bonhomme, in a Memoir (1) read to the National Society of Medicine at Paris, has recommended the internal use of the phosphates of lime and soda and the external use of a solution of potash, for the cure of ricketts, and he has related several cases, wherein these remedies were employed with advantage. He considers this disease, as depending on the one hand upon a defect of the phosphoric acid and on the other hand upon the development of an acid, approaching in its properties to the vegetable acids, particularly the oxalic. He thinks that, in consequence of a defect of bile in ricketty patients, this acid is developped in the primæ viæ, enteres the blood, disturbs the circulation and attacks and softens the bones. He has not however given any absolute proofs of

(1) See an analysis of this Memoir by Hallé, in the 18th Vol. of the Annales de Chimie for August 1793, or a translation of it in the 1st Vol. of Nicholson's Journal.

the existence of this rachitic acid in the blood-vessels, nor indeed has he rendered it probable (1).

Having endeavoured to establish these two propositions, 1. That there is a deficiency of phosphate of lime in the bones of ricketty patients; 2. That the development of the oxalic acid is the cause of this alteration, he concludes that the treatment of ricketts ought to turn on these two principal points, viz. to

(1) According to Fourcroy and Vauquelin oxalate of lime is one of the most common ingredients of urinary calculi: They found it in the proportion of one sixth in the number that they examined: The calculi, resembling mulberries in their form, are composed of this oxalate and an agglutinating animal matter. But they never could discover the oxalic acid present in the urine in a disengaged state. The smallest quantity of this acid, poured into urine, gives an abundant precipitate of oxalate of lime, which proves to them, that an acid of this kind cannot remain dissolved in the urine. They consider the production of oxalic acid as preternatural and morbific and are of opinion, that when a mulberry-shaped calculus is formed, its production takes place at the moment even of the formation of oxalic acid. There is reason to believe, say they, that some urines, which are white and muddy when made, are charged with oxalate of lime, and that this salt, formed by a cause entirely unknown, thus passes out of the body without producing calculi. See Ann. de Chimie Tom. 31. p. 64.

"*prevent the development of oxalic acid and re-establish the combination of the phosphoric acid with the base of bones—a combination, to which alone they owe their solidity.*" He concludes from some experiments, made upon fowls of the same incubation, that the phosphate of lime does pass from the stomach and intestines into the blood vessels and promote the progress of ossification. He fed some young chickens with their ordinary food; to others he gave a quantity of phosphate of lime mixed with their food; about two months after he killed them and found that the bones of those fowls, which were regularly fed with a mixture of calcareous phosphate, were evidently more solid and their epiphyses much less perceptible than those of the other fowls. His experiments with the phosphate of lime upon ricketty infants, whether exhibited alone or joined with phosphate of soda, convince him, that it contributes powerfully to the restoration of the natural proportions of the ingredients of bones and to the acceleration of the cure of the disease.

Admitting the theory of ricketts, given by M. Bonhomme, to be well founded, the phosphate of lime appears to be a very appro-

priate remedy; for the oxalic acid, attracting lime more strongly than the phosphoric acid, may decompose the phosphate of lime in the primæ viæ and be prevented from acting upon the phosphate of lime, either as mixed with the circulating fluids, or as deposited in the bones; whilst the deficiency of phosphoric acid in the system may at the same time be supplied. And the acetous acid, that is formed in the alimentary canal of ricketty children, may there become saturated with the phosphate of lime and be prevented from dissolving this substance in any other part of the system. If this theory be rejected, his experiments and observations may still seem to shew the utility of his practice in this disease and the propriety of extending it to the treatment of adults, afflicted with malacosteon.

The urine of patients, labouring under the latter disease, has been observed to deposit a copious white sediment (1), which has been supposed to be the earth of bones. Dr. Hosty informs us in his account of the case of Supiot, that the sediment was cre-

(1) See the cases of Mad. Supiot, of James Stevenson (Lond. Med. Obs. and Inq. Vol. 5) &c.

taceous and fermented gently with acids (1). And M. Sue, speaking of the same patient, says " from the analysis, that I made of this sediment, I had all the reason in the world

(1) See Phil. Trans. Vol. 48 p. 28 — If this sediment fermented with acids soon after the urine was made, it shews that there was carbonate of lime in it: But if the experiment were not made till some time after, the slight fermentation might arise from the presence of carbonate of ammonia. When experiments are made upon human urine with the view of ascertaining its contents, they should be made whilst it is recent; for recent urine differs very widely from urine that has fermented.

Recent urine, according to the experiments of Fourcroy and Vauquelin, who have analysed it with great care, contains 1. Acid phosphate of lime; forming from $\frac{1}{300}$ to $\frac{1}{700}$ part of the urine; the phosphate may be precipitated by the addition of alkalis, which combine with its excess of acid. 2. Phosphate of magnesia. 3. Phosphate of soda. 4. Phosphate of ammonia. 5. Uric acid, formerly named improperly lithic acid. 6. Benzoic acid. 7. Muriate of soda. 8. Muriate of ammonia. 9. Gelatine and albumen. 10. Urée, which constitutes about $\frac{1}{2}\frac{9}{0}$ of the matter contained in urine and imparts to it its smell and other characteristic properties —— Besides these true and constant materials of human urine, it contains accidentally, but rarely, sulphate of soda, muriate of potash, sulphate of lime, oxalate of lime and silex.

Putrid urine contains 1. Ammonia in excess. 2. Carbonate of ammonia. 3. Phosphate of ammonia. 4. Ammoniaco-magnesian phosphate. 5. Urate of ammonia.

to believe, that it was no other than the very substance of the bones dissolved" (1). It has not, however, been fully ascertained, whether the white earthy sediment, deposited by the urine of these patients, be carbonate of lime, phosphate of lime, or oxalate of lime &c.: And as an accurate analysis of their urine, bones (2) and blood might throw considerable light upon the proximate cause of this disease, I should wish to see it executed by some able chemists.

We have no good reason to believe that the oxalic, or acetous acid ever prevails in the fluids of patients afflicted with Malacosteon *adultorum*, much less that an acid of this kind acts upon their bones, dissolving the lime, which enters into their composition, and rendering them softer and yielding. It

6. Acetite of ammonia. 7. Benzoate of ammonia. 8. Muriate of ammonia. 9. Muriate of soda. 10. Gelatine and albumen. 11. Phosphate of lime: But the two last substances are precipitated—See Ann. de Chimie T. 31. p. 48—71.

(1) See Bromfield's Surgery. V. 2. p. 39.

(2) The bones of Mary Hayes, mentioned above, were examined by an ingenious chemist, who could neither discover an acid, nor an alkali in them, according to Gooch.

has never been shewn by experiment, I believe, that the blood contains either these or any other acid uncombined. The urine of a healthy person, however, does contain a minute quantity of phosphoric acid in a free state, which renders the phosphate of lime soluble in this fluid (1); but this disengaged portion of phosphoric acid appears to be formed in the urine, consequently cannot act upon the bones; and it has not been shewn even, that the urine of these patients does contain an unusual quantity of phosphoric acid in an uncombined state.

Hence I am led to suspect, that the deficiency of terreo-saline ingredients in the bones, in cases of Malacosteon, arises from an increased absorption of these substances, independently of any solution, or decomposition of them by the oxalic, acetous, phosphoric, or any other acid; and in *Rachitis*, from a diminished deposition of these sub-

(1) Phosphoric acid, obtained from burnt bones by means of the sulphuric acid scarcely acts at all upon phosphate of lime, but this acid is very impure; it holds in solution a quantity of the sulphate of lime, formed by the combination of sulphuric acid with the lime of the bones. See a Memoir on the Phosphate of Lime by M. Ekeberg, in the Ann. de Chim. Tome 32. p. 230 & s.

stances. In some very bad cases, however, it is probable that the secretion of ossifying substances may be lessened and the absorption of them increased in the bones at the same time: And, as has been intimated above, even the cartilaginous or membranous base of the bones has been sometimes removed, or very much altered in its texture.—Perhaps in some cases of Malacosteon, the lime, entering into the composition of the bones, undergoes a decomposition.

From this view of the proximate cause of *Rachitis* a principal curative indication seems to be to *increase the secretion and deposition of the phosphate and carbonate and sulphate of lime in the bones;* and one mean of fulfilling this indication may be to exhibit the above mentioned ossifying substances, or their elements; for I apprehend that a sufficient quantity of these earthy salts, or of their elements, is not introduced into, or generated in, the blood of ricketty patients.

From the view of Malacosteon given above, the principal indications appear to be, *to diminish the absorption of the terreo-saline ingredients of bone, or to increase the deposition of them.* But, being totally unacquainted

with the means of fulfilling either of these indications *directly*, I can only hope to point out such remedies as may *indirectly* restore the balance of deposition and absorption of ossific matter; relieve urgent symptoms; and prevent or diminish deformity.

The curative and palliative indications, with the means of satisfying them, which I have to propose, are the following:

1. *To support and increase the vigour of the system*, by a nutritious diet, moderate exercise, free air, cold or tepid bathing, tonics &c.

2. *To supply the system with the substances, that enter into the composition of bone and give them their firmness.* For this purpose we may give burnt bones or burnt hart's horn, finely powdered, or phosphate of lime formed by the mixture of phosphate of soda and muriate of lime, which has the advantage of being more finely divided than can be done by mechanical means: Or we may exhibit phosphoric acid and limewater in succession; or phosphate of lime dissolved in the phosphoric, acetous, or muriatic acid and afterwards limewater; or we may give phosphate of soda and afterwards muriate of lime. The administration of these remedies may not appear so likely to prove serviceable in this disease,

as in *Rachitis*; but, as a portion of the phosphate of lime &c. has been already carried out of the system, the introduction of an additional quantity seems necessary to supply this defect.

3. *To relieve pain* by internal remedies, as opium, and by external applications, as stimulating embrocations, blistering, issues &c —Perhaps issues and blisters may also prove beneficial by changing the diseased action of the vessels of the part, as in cases of the curvature of the spine, producing paralysis of the extremities. It is scarcely necessary to point out the means of relieving other urgent symptoms.

4. *To prevent deformity, or to redress or lessen the distortion of the bones, that has already taken place.*

This is to be effected by a recumbent posture, by the use of crutches, or a chair with stuffed moveable arms and other mechanical contrivances *. When the patient is a child-bearing female, this indication ought to be particularly attended to.

5. As the ling liver oil was the only remedy, which Gyte used and to which she attri-

* See Darwin's Zoonomia, Vol. II. page 89.

buted her cure, it may be given upon an empirical ground; for I do not pretend to explain its modus operandi, or to determine whether it possesses any advantages over other animal oils. My friend Dr. Barton has mentioned the oleum scatinæ or raiæ as applied externally with advantage to ricketty children in the north of Scotland (1).

These means ought to be diligently employed, as soon as the disease is ascertained; otherwise, though we should succeed in curing it, the deformity may be permanent and, when it occurs in a female, by impeding parturition may prove destructive to her, or her infant, or both as in the case of Ellen Gyte.

Malacosteon generally proving fatal and its destructive effects in many instances being extended to another life, besides that of the

(1) Nec reticendum est, quod Doctor Moore in sua Diss. Inaug. protulit: Is refert oleum scatinæ, seu raiæ, corpori inunctum in plagis Scotiæ septentrionalibus multum profuisse." De Rachitide p. 44—Perhaps, as the urine of horses and other graminivorous animals contains no phosphoric acid either disengaged, or combined with lime, but an acid of a vegetable nature, which has been proved by Vauquelin and Fourcroy to be the benzoic, the additional quantity of animal matter, introduced by exhibiting ling-liver oil, may supply an increased proportion of phosphoric acid to the system.

patient labouring under it, the prevention of it is an object of great importance: And, as every rational attempt to prevent the disease must be founded on a knowledge of its remote causes, I shall in the next place offer a few observations upon these.

In some instances this affection of the bones has been preceded by Diabetes, Siphilis, Scorbutus, Rheumatismus &c, and hence it has been supposed, that these diseases have given occasion to it by inducing a particular acrimony of the fluids. The opinion of a general acrimony of the fluids being an exciting cause of this malady has received further support from the observation, that some of this unfortunate class of patients had previously indulged in the use of an uncommon quantity of saline substances, as salt, or vinegar. Supiot for two years before the attack usually eat a pound, or a pound and a half of common salt in a week, without any vehicle, as we are informed by M. Sue.

It is not my intention to enter further into the consideration of an acrimonious state of the blood, as a remote cause of this disease, or to point out the means of preventing the production of it from this source. There are two circumstances, which independently of

acrimony appear to me to be the most common remote causes of Malacosteon, namely pregnancy and nursing. Upon these I think it necessary to dwell longer.

A very great proportion of the persons afflicted with this disease, especially its most common form (see Malacosteon *adultorum*, var. β in the next section), have been females in a low situation and who have had children in quick succession: This circumstance may, I think, be satisfactorily accounted for in the following manner. During pregnancy the appetite and digestion are very frequently impaired, whence the soft parts of the body are perceptibly wasted and, as the fœtus derives its whole supply of ossifying matters from the mother, I suspect that she is frequently deprived of a portion of these, which is necessary for her own system. The lameness, to which some pregnant women are subject in the latter months, is not, I think, wholly imputable to the pressure of the gravid uterus; but is partly to be attributed to the cause above mentioned. The slowness of union, or the total indisposition to unite, that has been often observed in the fractured bones of pregnant women seems to furnish another argument: And, as a further

proof it may be observed, that malacosteon, which had made a rapid progress during the latter months of pregnancy and for some time after parturition, has in many instances been checked, or suspended in the intervals of pregnancy and nursing. It is a curious fact, that the bones in the vicinity of the uterus, those of the spine and pelvis for example, suffer more frequently and in greater proportion, than the bones of the extremities.

A woman, whose child is entirely supported by the breast, may be considered in some measure, as in a similar predicament with a pregnant woman: For her suck (1) supplies the infant with every particle of phosphate &c of lime, that is received into its system. And, if she be sickly, or ill fed, this would appear to be done at an expence,

(1) Fourcroy has discovered, that the serosity of human milk is most charged with calcareous phosphate immediately after parturition and that the proportion of this substance gradually decreases, whilst the other nutritive parts, of which it is composed, are augmented in an inverse ratio. See Ann. de Chim. T. 18. p. 135 & s.—— This circumstance shews the impropriety of allowing ricketty children to remain too long at the breast and the preference to be given to a nurse, who has been but lately delivered, for a young infant.

which her own bones cannot bear without injury.

A female, who gives suck during her pregnancy and is at the same time indisposed or ill fed, which is not uncommon amongst the lower classes, must suffer in a still greater degree from the expenditure of ossific matter.

When a woman does not breed very quickly and her health is unimpaired, there is reason to believe that the proportion of phosphate of lime, of which she has been deprived during pregnancy and nursing, is either not derived from her bones, or, if taken from thence, is soon restored. But, when a woman has children in quick succession, or gives suck during the greatest part of the intervals of pregnancy, the loss of ossific matter in some instances appears to be never restored. The proper balance, betwixt the secretion of phosphate, carbonate and sulphate of lime in the bones and its absorption from thence, seems to be never re-established. The disease continues its progress, till the patient is destroyed by it, or till she dies in consequence of difficult parturition from the deformity, which it has produced in the pelvis.

From the above view of the origin of this variety of the disease in females, the means of prevention are obviously these.

1. To prevent too frequent conception.

2. To avoid nursing, or to shorten the period.

3. To support the strength by nutritious diet &c.

4. To exhibit the phosphate of lime ready formed, or its constituent parts, during pregnancy and nursing.

SECTION IV.

OF THE CHARACTERS, SYNONYMS &C OF MALACOSTEON AND ITS SPECIES.

Dr. Cullen has not given any place to the softness of the bones, occurring in adults, in his Nosologia Methodica. He has not even enumerated it in the Catalogue of diseases, which he intimates ought not to have been omitted by him.

It has, however, a place assigned to it in the nosological systems of Sauvages, Vogel, Sagar, Macbride, Selle, Daniel and Ploucquet, and by some practical writers, as will be seen from the references given hereafter.

Since Rachitis and Malacosteon agree in many of their symptoms and since the diver-

sity, observable in them, depends principally upon the states of the system at the different periods of life, in which these diseases make their appearance, I am of opinion that they are properly referrible to the same genus.

By Cullen Rachitis is referred to the third class and third order of his system, *Cachexiæ —Intumescentiæ.* But, if we take the character of this genus, as given by himself, viz. "Caput magnum anterius maxime tumens; genicula tumida; costæ depressæ; abdomen tumidum; *cætera marcescentia.*" Tom. II. p. 289, it would appear, that Rachitis may without impropriety be placed in the *first* order of the third class, *Marcores;* and, when Malacosteon is associated with Rachitis, so as to constitute one genus, it would be obviously improper to refer this genus to the *Intumescentiæ* of Cullen, whilst it may be very well arranged in the order *Marcores*, more properly indeed than in the order *Dyscinesiæ*, or any other part of his system.

I propose therefore to include these two diseases (1) under one genus, to which I shall give the name of Malacosteon, as expressive of the leading circumstance; and to

(1) Dr. Denman refers them both to Rachitis in his Introduction to Midwifery. Vol. II. p. 16.

refer it to the *Cachexiæ—Marcores* of our celebrated british nosologist, with the following character, synonyms &c.

MALACOSTEON. *Vogel* — Osteosarcosis *Macbride* — Rachitis *Sauv. Linn.* &c &c. — Astheniæ, Ostocopi, Rachialgiæ species *Sauv.*—Astheniæ, Osteocopi spec. *Sagar*— Osteocachexiæ spec. *Daniel.*

Debility; lameness; distortion, or deformity, independently of external violence.

1. MALACOSTEON *Rachitis.*

Attacking infants; epiphyses of the cylindrical bones larger than natural; limbs weak, flaccid, bent; head and belly enlarged.

Rachitis *Culleni Syn. Nos. Meth.* T. II. p. 289—*Linnæi Gen. Morb.* 212—*Vogelii Defin. Gen. Morb.* 523—*Sagari Syst. Morb. Sympt.* p. 174—*Sellii Rudim. Pyr.* &c. p. 375 & *Lib. de cur. hom. morbis* p. 223—*Glisson de Rach.*—*Boerh. Aphor.* § 1480—*Van Swieten Comm.* V. p. 578—*Hoffman.* III. p. 487—*Zeviani della cura* &c — *Buchner* in Halleri Disput. ad Morb. Hist. &c VI — *Callisen Princ. Syst. Chir. Hod.* II. p. 646—*Barton Diss. Med. Inaug.* Edinb. 1786— *Cullen's First Lines* &c. IV. p. 332—*Bonhomme in Ann. de Chimie.* T. 18—*Hevin Cours de Path. & Thérap-Chirurg.* T. II. p. 465—*Darwin's Zoonomia.* II. p. 87.

The Varieties of this species are

α. Simple, unaccompanied by any other disease—Var. 1. Cullen—R. nodosa & Britannica *Sauv.* Tom. II. p. 539. *Sagar.* p. 174.

β. Complicated, occurring with some other disease—Var. 2. Cullen—R. strumosa, polonica, elephantiaca. *Sauv.*

II. 541—R. strumosa, polonica & elephantina *Sagar.* p. 174, 175.

Description. Peculiar to infants, scarcely attacking them before the sixth month, or after the second year; continuing till the third year sometimes; more rarely till the sixth, or later. Whole body emaciated and debilitated, with paleness and flaccidity -— Head unusually large; forehead prominent; fontanelles wide; teeth late and slow in appearing, soon turning black, becoming carious and falling out: Capacity for the most part acute and forward, sometimes dull—Trunk deformed; clavicles distorted; ribs flattened or pressed inwards; sternum mostly projecting; spine distorted in different parts and in various ways; form of the pelvis changed (1); belly tumefied; dyspnœa; appetite sometimes voracious, rarely impaired; fæces generally whitish and liquid — Limbs curved; epiphyses of the ulna, radius, tibia and fibula, especially the lower ones, larger than natural and spongy *. Lameness; aversion to motion; difficulty or inability of standing or walking. The pulse at first scarcely affected; as the disease advances, becoming weaker and more frequent; the digestion and other functions at length more or less disturbed.

On dissection the abdominal viscera have been found unusually large; the mesentery filled with tubercles; the lungs adhering to the pleura and tubercular; the bones softened: the muscles whiter, more tender and flaccid.

(1) See Plates 4, 5, & 6.

* A figure of a girl, extremely distorted in consequence of M. *Rachitis*, may be seen in Haller's Disput. ad Morb. Hist. &c. T. VI. tab. 28.

2. Malacosteon *adultorum.*

Seizing adults; pains of the spine, pelvis or limbs; deformity of the trunk, or limbs; diminution of stature.

Asthenia ab osteosarcosi, *Sauv.* Tom. II. p. 804.

Ostocopus ab osteosarcosi, *Sauv.* T. II. p. 28.

Rachialgia osteosarcosis, *Sauv.* T. II. p. 137.

Osteocopus sarcomaticus, *Sagar.* p. 218.

Asthenia osteosarcosis, *Sagar.* p. 531.

Cachexiæ malacia *Ploucquet Delin. Syst. Nos.* T. II. p. 16.

Osteosarcosis *Sigwartii Dissert.* &c. Tub. 1781 — *Denman's* Introduct. to Midwifery, p. 16.

Innutritio ossium, *Darwin's Zoonomia.* II. p. 84.

Spinæ distortio. *Ibid.* p. 87.

Malacosteon *Hull's Defence of the Cesarean Operation* p. 172, 188 &c—*Hull's Observations on Mr. Simmons's Detection &c.* p. 192 &c — *Mr. Wood's Account of the Case of Elizabeth Thompson, Append. to the 5th vol. of Mem. of the Med. Soc.*

Mollities ossium *Boelmeri Diss.* &c. Hal. 1763 — *Bromfield's Surgery.* II. p. 25 — *Dr. Cooper in Med. Obs. & Inq.* Vol. 5. 217.

Mollesse des os *Hevin Cours de Path. & Thérap. Chir.* II. p. 463.

Softness, flexibility &c of the bones *Phil. Trans. abr.* Vol. IX; *Phil. Trans.* Vol. 48. p. 26 & 297—*Gooch's Surgery.* II. p. 293—*Thompson in Med. Obs. & Inq.* V. p. 259. *Vaughan on the Hydrophobia* &c. p. 61—*Hamilton's Outlines of Midwifery.* p. 273. p. 304 &c—*Welchman in London Med. Journal for* 1790.

Var. α. Universal, affecting all, or most of the bones—This is very rare.

β. Partial, affecting the spine, or pelvis, or both; rarely extending to the limbs—This is not uncommon; it occurs principally, if not solely in women.

γ. Partial, affecting a single limb only.

Description. Generally attacking adults, rarely appearing before puberty. Emaciation and debility of the whole body. Pains of the limbs, pelvis, or spine, more or less severe and constant, increased by motion. Deformity of the trunk; projection of the sternum; distortion of the pelvis and lumbar vertebræ (1). Bones of the limbs softer than natural, bent (2). Stature decreasing gradually, in some instances becoming a foot, or a foot and a half less. Urine sometimes depositing a copious earthy sediment, at other times of a natural appearance. Pyrexia in some cases present at the beginning of the complaint, in others supervening at a later period. Respiration and other functions disturbed. In females parturition is rendered more difficult and sometimes delivery by the natural passages becomes impossible.

On dissection the bones have been found of various degrees of softness. In some cases every bone, except the teeth, has been very much softened. The cylin-

(1) See Plates 1, 2 and 3—The curvature of the spine in this disease is from without inwards; whilst in the affection of the spine, producing paralysis of the limbs, the curvature is from within outwards; that is, the back in the former complaint is unusually hollow, in the latter very prominent — See Pott's Works Vol. III. p. 402. London 1783.

(2) See an engraving of M. Supiot and of her skeleton in Bromfield's Surgery, Vol. II. pl. 2d & 3d.

drical bones have been found converted into a parenchymatous substance and filled with a reddish matter, resembling the crassamentum of blood, instead of marrow. The bones of the cranium have been observed to be softer, of twice the natural thickness and without any vestige of diploe. The state of the cartilages is always natural.

DIAGNOSIS. This disease differs from Rheumatismus and Arthrodynia, to which it is nearly allied in the beginning, in the following circumstances; 1. The pains and lameness are more obstinate; 2. The joints are less affected; 3. A deformity of the trunk, or limbs, and a gradual decrease of stature take place — Hence in treating very obstinate complaints, supposed to be Ischias or Lumbago, especially in females, it will be proper to measure the patient occasionally and to observe whether the pelvis and spine are undergoing any alteration of form.

SECTION V.

THREE CASES OF MALACOSTEON ADULTORUM, WITH AN ANALYSIS OF THE URINE OF THE THREE PATIENTS, &c.

Case I.

Hannah Davis of Bradshaw-Street, Manchester, aged 22, was married when she was only 16 years old and has born four children at the full time. She fuckled the first child about four months and then weaned

it in consequence of being attacked with a severe typhus. The second she gave suck to only during three months, the child dying at the end of that time. Of these two children she had easy labours. She nursed her third child nine months, and was in the beginning of the third month of her fourth pregnancy, when she weaned it. Her fourth child was dead born. The third labour was hard and long, but her delivery was effected without instruments. In her fourth labour she was with difficulty delivered by the perforator and crotchet.

Soon after her second labour she began to have pain in her back and became rather lame. She afterwards grew better and remained so, till she was in the fifth month of her third pregnancy. At this time she had a good deal of pain in her right hip, as well as her loins, and was lame. After her delivery she again became better. During the whole of the four last months of her fourth pregnancy, her pains and lameness were so much increased, that she could not walk over her room floor without assistance. In about six or seven weeks after her fourth labour, she again became able to walk without assistance, her pains abated and her general health im-

proved. Her stature decreased suddenly four inches soon after her fourth labour, and she thinks she is not become any shorter since.

She has led a sedentary life, being employed in mending damaged pieces of fustian. Her diet has been generally of a mixed kind and she has never indulged in using vinegar or salt improperly. After her third labour, she took ling liver oil in gin every day for about a week and rubbed the pained parts with the same. Her pains were rather relieved by this remedy; but supposing that both herself and her child were rendered more liable to take cold by the use of it, she gave it up.

At this time she is thin and very short. She experiences no pain, when she is sate at her work; but she always feels pain of a smarting kind in her back and right hip, when she stands or walks. Her respiration is easily hurried, and she is soon fatigued with walking. She has no pain in her limbs; sleeps well; has no unnatural heat on her skin; no thirst or want of appetite. Her pulse is neither very small, nor frequent. She menstruates regularly and has a greater discharge of blood than she formerly had. Her urine is generally clear when made, is of a straw colour, and

has only a cloud in it on standing for twelve hours or longer; but sometimes, she says, it deposits a copious white sediment like chalk. When her urine is clear, she is in better health.

Case II.

Mrs. R— of Blackburn, aged 40, was formerly a well formed woman. She has been the mother of eight children, of some of which I delivered her. None of her labours were difficult except the last, when such a degree of distortion had taken place in the superior aperture of the pelvis, that Mr. Chew, to whom I am indebted for the particulars of her case, was under the necessity of performing the operation of embryulcia.

She first perceived her health to decline about twelve years ago, in the interval of her third and fourth labours; so that five of her children have been born, since the primary symptoms of the disease took place. The complaint began about the last cervical vertebra and gradually descended downwards along the spine to the pelvis, producing pain, weakness, and some degree of lameness. She believes she has lost eight, or ten, inches

in height, and she now walks in a half-bent position.

It is more than four years since her last labour and no opportunity has offered of ascertaining the present state of her pelvis; but from her almost constant bad health and the great diminution of her stature, there is reason to believe, that it has suffered since that time a considerable degree of contraction. This seems confirmed by her own account, as she says the passages are nearly closed.

From the great narrowness of her chest, she is very liable to pulmonic complaints upon slight exposure to the usual external causes. When her health is better, she walks tolerably well, as the disease has not affected her extremities. She menstruates regularly. Her urine is sometimes of a natural appearance, at other times it has a turbid milky appearance and deposits a white sediment. She has never known it continue so long free from the white sediment, as it has done at this time.

The affection of the bones seems to be at present stationary, or making a very slow progress.

Mrs. R—— cannot attribute the attack of her complaint to any other cause than giving suck. She never was fond of salt, or vinegar, or any kind of pickles. She suckled six of her children about 12 months each; for the seventh child she had no suck. During her sixth pregnancy she gave suck, till the fœtus quickened: Her health continued declining through this pregnancy and towards the latter end of it she was obliged to be carried to and from bed: After her delivery she grew better.

About eight years ago, being on a visit at Liverpool, she tried electricity with great advantage. It removed the pain and she could walk with perfect ease for a short time afterwards.

Case III.

Mrs. B——, of Withy-Grove Manchester, aged 46, was married at the age of 23 and has born nine children at the full time. Seven of these were born alive and are healthy: The two last were dead born. Her labours were all expeditious except the last. She suckled each of the children, that were born alive, about eleven months. The intervals

betwixt the births of her children were always about two years. She ceased to menstruate about twelve months since.

Her stature has decreased a foot or more. She measures only four feet at this time. Her neck was formerly rather long, but her shoulders are now so much elevated, that she appears to have scarcely any neck. She is not quite 16 inches from the crown of the head to the os sacrum. Her back is excessively hollow, the shoulders and os sacrum very prominent. Her sternum projects and is much bent. Since the form of the thorax has become so much altered, her respiration has been short and is easily hurried. The left os ilium is raised much higher than the other and this side of the pelvis appears to be considerably more affected. Her limbs are not distorted, nor does she suffer any pain in them, except occasionally in her knees from taking cold. The deformity and diminution of stature have taken place entirely within the two last years.

It is about nine years, since she first began to complain of pains in her loins and hips: She was then in the fourth month of her seventh pregnancy. This attack she attributes to taking cold from a damp house.

Before the birth of this child she became lame and has remained so ever since.

Her health has been better for the four last months than it has been for two years. She has no feverish symptoms; no pain from sitting or standing: Her appetite is tolerable: Her urine is in small quantity and of the natural colour; nor does she recollect, that it has ever been white and turbid, when passed. Some time ago she could not walk over her room floor, without taking hold of some person, or the furniture; but she can now, though not without difficulty, walk over the floor entirely unassisted. She is carried down stairs every morning and remains out of bed through the day; but she has not been out of the house during the last three years.

Mrs. B —— formerly led an active life and used the same food as the rest of her family: She never took common salt in any unusual quantity, but has always used vinegar freely, though not in excess.

Experiments upon the urine of these three patients and that of a healthy adult.

The urine, taken singly, affords excellent characters of a few diseases, e. g. *Diabetes* and *Icterus*, which for brevity and certainty

may vie with the best essential characters, given by Linnæus in his Systema Naturæ. In many other complaints the quantity and quality of the urine are considered as very deserving of the attention of physicians, both as aiding them in the prognosis and as constituting a part of the histories of those diseases: And we have great reason to believe, from an ingenious paper published by Mr. Cruickshank in the Second Edition of Rollo's Cases of Diabetes, that still further assistance in the diagnosis of diseases may be derived from a more careful examination of this excrementitious fluid by the application of different re-agents (1).

Conceiving that further light might be thrown upon the nature of Malacosteon *adultorum* by an analysis of the urine of persons, afflicted with this malady, I have availed myself of the opportunities, which have offered, of examining the urine of the three females, mentioned above, with great care and attention; and though, partly from the disease being stationary, or making but slow progress, and partly from the constant varia-

(1) He has shewn that a very minute portion of bile may be detected in the urine by the addition of muriatic acid &c &c.

tion of the quantity of saline and other ingredients in the urine both of healthy and diseased persons, the results may appear not very satisfactory, I shall relate my experiments in hopes of inducing other practitioners, who may meet with patients in a more favourable state, to repeat these experiments upon their urine.

The urine of all these three women, which I analysed, was of a pale lemon colour and exhibited only a slight cloud on standing about twelve or fourteen hours. In no instance did it deposit the copious white earthy sediment, mentioned by authors as occurring in this disease; so that I have hitherto had no opportunity of determining, whether this sediment consists of phosphate, oxalate, or carbonate of lime, or of an admixture of two, or more of these substances. Should this white sediment occur, it may be proper to observe, that this should be well washed with distilled water and then, if it consist of carbonate of lime, an effervescence will be produced by the addition of diluted muriatic acid and a clear solution will be formed; if it be phosphate of lime, it will dissolve completely in diluted muriatic acid without effervescence and may be precipitated from this

acid by a solution of pure ammonia, and if it be exposed to a high degree of heat, its whiteness will not be impaired; if it be oxalate of lime, it will also dissolve in muriatic acid without effervescence; but, if it be exposed to a high degree of heat, the oxalic acid will be decomposed and the powder will become blackish.

Along with the experiments, made upon the urine of these patients, I shall mention the result of exactly similar experiments, made upon the urine of a healthy adult of middle age, that any deviation from the healthy standard may be immediately and clearly perceived.

Experiment 1st. A slip of paper, stained with litmus, was dipped in the urine of a healthy adult and was slightly reddened by it.

The urine of H. Davis, Mrs. R. and Mrs. B. produced a similar change in slips of litmus-stained paper.

This experiment shews the presence of a small quantity of free, or disengaged acid in the urine of each of these persons, which is necessary to hold the phosphate of lime in solution.

Experiment 2d. A solution of pure ammonia was added to four ounces, by measure, of

the urine of a healthy adult, till it was evident from the smell of the mixture, or from the change produced by it in the colour of paper, stained with litmus, or radish juice, that the alkali prevailed. The urine became turbid and was filtred through a piece of paper, accurately weighed. The filtring paper with the precipitate adhering to it was dried perfectly and weighed; the weight of the filtring paper being then deducted, the precipitate was found to weigh in one instance $3\frac{1}{2}$ grains; in another $2\frac{3}{4}$; in another $2\frac{1}{2}$; in another $2\frac{1}{4}$; and in another 2 grains—Average 2.6 grains in 4 ounces.

Four ounces of Davis's urine treated in the same way yielded in one instance 4 grains; in another $3\frac{1}{2}$; in another 3; in another $2\frac{3}{4}$ grains—Average 3.312.

Mrs. R—'s urine yielded 8 grains; 5; 4; $2\frac{1}{4}$;—Average 4.812 grains.

Mrs. B—'s urine yielded $6\frac{1}{4}$; 6; $4\frac{3}{4}$; $2\frac{3}{4}$; $1\frac{1}{2}$ grains—Average 4.25 grains.

In this experiment the ammonia combining with the free phosphoric acid, the phosphate of lime, held in solution by that acid, is precipitated (1). We learn from this experiment, that the average quantity of phos-

(1) It was not determined, whether this precipitate contained any phosphate of magnesia.

phate of lime, carried out of the system in the urine, is greater in all the three patients than in the healthy adult and in Mrs. R. is more than double the quantity. And though the quantity may appear small at first view, yet when it is considered that this is constantly carried out for months and years, its effects may at length become very considerable.

Experiment 3d. To $1\frac{1}{2}$ ounce of the urine of a healthy adult $5\frac{1}{2}$ ounces of lime water were added. The mixture was kept in a vial, well corked, for several hours. The clear part of the liquor was then carefully poured off and the remainder was filtred. The precipitate, when perfectly dried, weighed in four different instances $8\frac{1}{2}$; 6; $4\frac{1}{2}$; 3 grains —Average 5.5 grains in $1\frac{1}{2}$ ounce of urine.

H. Davis's urine yielded $6\frac{1}{2}$; $4\frac{1}{2}$; $4\frac{1}{4}$ grains —Average 5.083 ([1]) grains.

Mrs. R—'s yielded 6; 5; 3 grains—Average 4.666 grains.

Mrs. B—'s urine yielded 7; $4\frac{1}{4}$; $2\frac{3}{4}$ grains —Average 4.666 grains.

In this experiment the lime not only saturates the free phosphoric acid and precipitates

([1]) It has not been judged necessary in expressing the fractions of grains to go beyond three places of figures.

the phosphate of lime, held in solution by it; but it also decomposes the phosphates of soda and ammonia, contained in the urine, and uniting with their acid forms phosphate of lime (1), hence this substance is obtained in greater proportion, when lime water is made use of than when ammonia is employed — From this experiment it appears, that the healthy urine contained more free phosphoric acid, or a greater proportion of phosphates of soda and ammonia, or of both, than the urine of Mrs. R— and Mrs. B—, and rather less than the urine of Hannah Davis.

Experiment 4th. To 4 ounces of the filtred urine of a healthy person, from which the phosphate of lime had been precipitated by a solution of ammonia, as in Exp. 2d, a solution of muriate of barytes was added, till no further precipitation took place. The precipitate, when dried, weighed 17; $14\frac{1}{2}$; $8\frac{1}{2}$ grains—Average 13.333 grains (2).

(1) On this account lime water promises to be an useful remedy in Malacosteon, though unaccompanied by any medicine containing phosphoric acid. See above page 196.

(2) Four ounces of healthy urine, upon which no previous experiment had been made, yielded 22 grains in

H. Davis's urine yielded 19; 18; 17½ grains—Average 18.166 grains.

Mrs. R—'s urine yielded 14¾; 14; 12 grains—Average 13.583.

Mrs. B—'s urine yielded 32½; 26½; 24 grains—Average 27.666 grains.

The phosphates of soda and ammonia are decomposed in this experiment. The muriatic acid combines with the two alkalis and forms neutral salts, which remain dissolved in the water; whilst the barytes combines with the phosphoric acid and forms phosphate of barytes, which is precipitated in a very fine white powder.—This experiment therefore shews, whether the phosphates of soda and ammonia are in a greater, or less proportion than the healthy standard. Here the proportion was greater in the urine of the three patients than in the healthy urine.

Experiment 5th. A saturated solution of acetite of lead was poured into four ounces of the urine of a healthy adult, till no fur-

one instance and 20 grains in another—Mr. Cruickshank found, that healthy urine with this re-agent, yielded a precipitate of 13 grains, which he found to be equivalent to about 24, or 25 grains of microcosmic salt, or the phosphates of soda and ammonia, as these are usually mixed in the urine.

ther precipitation ensued. The precipitate, when dried, weighed 33; 33; 28 grains—Average 31.333 grains.

H. Davis's urine yielded 57; 27; 25 grains—Average 36.333.

Mrs. R—'s urine was not submitted to this experiment.

Mrs. B—'s yielded 44; 37; 32 grains—Average 37.666.

This experiment indicates the proportion of both the muriatic and phosphoric salts in the urine; for the muriates, as well as the phosphates, are decomposed and the precipitate consists of muriate and phosphate of lead.—To determine the proportion of these substances, the precipitate is to be digested in twenty times its weight of hot distilled water. The muriate of lead becomes dissolved and the phosphate of lead remains insoluble; consequently the loss of weight, sustained by the precipitate, shews the quantity of the muriate of lead. I treated twenty grains of precipitate, obtained from the urine of a healthy person, in this way and it lost only three grains: But Mr. Cruickshank, having obtained 31 grains of precipitate from 4 ounces of healthy urine and digested them in hot water, found that seven grains were

taken up; the remaining 24 grains were found to be phosphate of lead and equivalent to 23 or 24 grains of microcosmic salt—We find from this experiment, that the healthy urine contained a less proportion of phosphates and muriates, taken together, than the urine of either H. Davis, or Mrs. B—.

Experiment 6th. An infusion of galls was added to 4 ounces of healthy urine, till no further change took place. The precipitate, when dried, weighed 6; 5; $4\frac{1}{4}$ grains—Average 5.083 grains.

H. Davis's urine yielded 22; 11; $5\frac{1}{2}$ grains—Average 12.833 grains.

Mrs. R—'s urine was not examined by this re-agent.

Mrs. B—'s urine yielded 16; $9\frac{1}{4}$; $8\frac{1}{2}$—Average 11.25 grains.

The principle of tan, or *tannin*, detects the mucilage or gelatine in urine—According to Seguin, the precipitate, produced by infusion of galls from urine, is much more copious, where the digestion is much impaired. The proportion was considerably greater from the urine of the above two patients than from the healthy urine.

Experiment 7th. Three ounces of healthy urine being evaporated, till the extract was

dry enough to be rubbed easily into a dark-coloured powder, this was found to weigh 20 grains.

Three ounces of H. Davis's urine yielded 22 grains — In another instance the same quantity of her urine yielded 61 grains; and I have to regret, that I did not ascertain the quantity of phosphate of lime &c in this portion of urine.

Three ounces of Mrs. R—'s urine yielded 16 grains.

Three ounces of Mrs. B—'s urine yielded $22\frac{3}{4}$ grains.

This experiment shews the proportion of salts, gelatine and urée, taken collectively, in three ounces of urine (1).

(1) According to Mr. Cruickshank (See his *Experiments on and the Manner of distinguishing several diseases by the urine*, in Rollo's Cases of Diabetes) the specific gravity of urine reaches from 1005 to 1033, that of distilled water being 1000. By evaporation 36 ounces yield a residuum, weighing from 1 to $1\frac{1}{2}$ ounce, which consists of salts and animal extractive matter. He observes with great propriety, that the relative proportions of these substances vary so much in the same person both in health and disease, that it is not easy to fix on what may be considered as a healthy standard for urine; but the proportions, he says, may be nearly as follow.

The other experiments, which I made upon the urine of these different persons, I deem it unnecessary to detail, as irrelevant to the present subject.

It was my wish to have added a similar series of experiments, made upon the urine of several ricketty children and that of a healthy little girl, taken as a standard. But, after taking a good deal of pains, I have not yet been able to meet with a sufficient number of well marked cases of Rachitis for this purpose. All but one of the children, that I have seen of late afflicted with this disease, have been so young, that their urine either

	Oz.	Dr.	Gr.
Muriates of potash and soda	0	1	0
Phosphates of soda and ammonia	0	3	50
Lithic acid and phosphate of lime with excess of acid	0	0	25
Animal extractive matter	0	3	40
	1	0	55

He observes, that the quantity of extractive matter in urine is more variable than that of any other substance; that the proportion of phosphate of lime is about two grains to four ounces; that the quantity of precipitate, obtained from four ounces, by muriate of barytes is thirteen grains, by acetite of lead thirty-one grains; by infusion of galls about four grains.

could not be collected at all, or not in sufficient quantity for experiments. I am, therefore, induced to postpone the publication of the experiments I have already made, till I have had an opportunity of analysing the urine of three, or more children in an advanced stage of ricketts.

This Appendix was originally intended only to comprise the two first sections. In consequence of an unexpected delay in the execution of the etchings of Ellen Gyte's pelvis, I was induced to write and print the third section, and, the plates being still detained, I have been led to add three sections more. These circumstances are stated here for two reasons; 1. That the reader may be apprized, that the opinions I have given in the third section with respect to the proximate cause of Malacosteon *Rachitis* and *adultorum*, are not founded on the experiments, which I have made on the urine of patients, labouring under these two diseases; for these were made subsequently to the writing of that section; and 2dly. That he may excuse the irregular arrangement of the cases of cesarean operation, which was utterly unavoidable on my part, and has arisen from five of these not coming sooner to my

knowledge. I have thought it better to give them a place in the end of this appendix, than not notice them at all.

SECTION VI.

A REPORT OF FIVE ADDITIONAL CASES OF THE CESAREAN OPERATION.

In three of the cases of cesarean operation, comprehended in this section, the event was favourable to the parent; in the remaining two it was unfavourable.

The three first cases are related by M. Baudelocque in the *Recueil Périodique de la Société de Médecine de Paris*, for January 1801: The two last are taken from the Medical and Physical Journal for the present month (June 1801).

First Case. In June 1793 M. Verdier, surgeon of the civil hospital of Nogent-le-Rotrou, in the Department of Eure and Loire, informed M. Haudry, that it was impossible to deliver — Thoureau of a living child by the natural passage, because the diameter of her pelvis, taken from the symphysis pubis to the os sacrum, appeared to him to be only 2 inches and she had already

been fatigued with fruitless pains for 7 or 8 days: These two accoucheurs, being agreed upon these points, decided in favour of the cesarean operation, which was performed in the *linea alba* about five o'clock in the evening. The incision was 9 inches in length and was carried downwards nearly to the ossa pubis. The womb was opened as low as possible and a living child was extracted with great ease. The woman lost so little blood during the operation, that they were very much surprized at it. Notwithstanding the length of the external wound, only one stitch was made near the middle of it and this it was found necessary to cut the next day about nine in the morning, on account of a painful drawing, which prevented the patient from coughing. The applications to the wound were retained by a bandage with an opening in it, that they might not be obliged to remove them at every dressing. The lochia were discharged freely by the inferior angle of the wound; but none passed per vaginam. The patient was cured in 45 or 50 days after the operation. A hernia formed in this woman very soon, which in the space of six months resembled a large melon in bulk. M. Haudry attributes the

success of this operation to the great extent of the external incision and to the uterus being opened in the middle of this; which, he says, favoured the passage of the lochia and afforded them an opportunity of seeing the uterine wound at each dressing; for he assures us, that it constantly presented itself under that of the integuments.

Second Case. M. Verdier was called the year following (1794), about a league and a half from Nogent, to see the wife of a labourer, who had been in labour during seven days. Having examined this woman, he estimated the antero-posterior diameter at an inch and ten lines. He sent for M. Haudry, who advised her to come to the hospital at Nogent, where she did not arrive till the ninth day of her labour at two in the afternoon. The operation was performed three hours after, in the same manner as upon the first woman. The child lived several months and the mother was completely cured in 25 or 30 days after the operation.

Third Case. This woman, having become pregnant again, placed herself under the care of the country gossips and surgeons, who dissuaded her from lying-in at Nogent, by promising to deliver her without having re-

course to the cesarean operation; which however they performed, after having tried in vain to deliver her with the forceps. She died in eight or ten hours after this operation, which was performed upon one side of the abdomen.

The above cases are attested by Messrs. Lefebure Sen. and Bisson, surgeons at Nogent-le-Rotrou, who declare that they saw these two women operated upon by Messrs. Haudry and Verdier, and that one of the women was still living on the 17th of Germinal in the 7th year (6th of May 1799) and also by the commission of the united civil hospitals of the aforesaid Commune of Nogent and the municipal administration of the same place.

Fourth Case. This was a successful operation and is related by Dr. Kurzwig of Riga. The woman had been in labour more than three days. Her pelvis measured only two inches in diameter. The incision was made in the *linea alba* to the extent of eight inches. The loss of blood was very inconsiderable. The wound was stitched and this part of the operation occasioned much pain. On the 7th day after the operation a piece of the omentum separated, that was incarce-

rated in the lower part of the wound. In the course of three months the woman was entirely cured and all the symptoms during this period were very slight. The child was in a very putrid state.

Fifth Case. This, though performed under favourable circumstances, proved fatal to the mother, but the child was preserved. It is related by Dr. Klein of Stuttgard. The pelvis of this woman was extremely distorted. The external incision was made in the right side of the abdomen, about two inches from the umbilicus, in an oblique direction. The woman died four days after the operation.

As all these cases were unknown to me, when the Preface* was printed, it will be proper to state here, that the whole number of cesarean births, recorded in this and my two former publications on this subject, amounts to *two hundred and thirty one;* that the successful ones amount to *one hundred and thirty nine* and the unsuccessful ones to *ninety two.*

In the beginning of the first Section of this Appendix, I have given a short account of the cesarean operation, lately performed at

* See Preface page 7th.

Edinburgh by Mr. John Bell and am happy in announcing, that his brother, Mr. Charles Bell, will give the full detail of this operation and the dissection with a series of Engravings, in a *Work on the Anatomy and Pathology of the Womb*. To the latter of these gentlemen I am much indebted for a beautiful drawing of the pelvis and a sketch of the skeleton of the woman, who was the subject of the operation. From these drawings and the communication, which accompanied them, I am enabled to state, that this woman was afflicted with Malacosteon *adultorum*. Her limbs were perfectly straight, and in their dimensions equal to those of a very tall woman. The bones of the trunk only had suffered. The scapula was found to be bent like a piece of heated parchment. The spine was so bent, that the aorta almost made a figure of 8. The chest was so compressed by the action of the muscles as to oppress the heart and lungs. The pelvis was most wonderfully distorted. The superior aperture was of the triangular form and its dimensions considerably smaller than those of the pelvis of Eliz. Thompson, of which a description and engraving are given by Mr. Wood in the *Appendix to the 5th Vol. of the Memoirs of*

the Medical Society and in my *Second Letter to Mr. Simmons.* The distance from the os sacrum to the union of the os ilium and pubis *on the left side* measured only one sixteenth of an inch; *on the right side* only half an inch. The largest circle, that the pelvis would admit in any part, was not more than one inch.

AN EXPLANATION OF THE PLATES.

Plate I.

A view of the superior aperture of the pelvis of Ellen Gyte.

A The symphysis pubis, or anterior symphysis of the pelvis.

B The junction of the 4th and 5th lumbar vertebræ.

EF The angles formed by the bodies of the 2 ossa pubis.

L The right sacro-iliac, or posterior symphysis.

M The left sacro-iliac, or posterior symphysis.

OO The heads of the thigh bones.

PP The cristæ of the ossa ilia.

Q The articulation of the os coccygis with the os sacrum.

R The spinous process of the left os ischium.

Plate II.

A view of the inferior aperture of the same pelvis.

A The apex of the os coccygis.
B The symphysis pubis.
CD The spinous processes of the ossa ischia.
EF The tuberosities of the ossa ischia.
a b Their nearest points.
GH The rami, or branches, of the ossa ischia.
IJ The rami of the ossa pubis.
K The sacro-vertebral angle.
LL Portions of the thigh bones.

Plate III.

A profile, or lateral view of the same pelvis.

A The third lumbar vertebra.
BB The cristæ of the ossa ilia.
C The right thigh bone.
D. The os coccygis.
EE The spinous processes of the ossa ischia.
F The symphysis pubis.
G The right foramen thyroideum.
Obs. The dimensions of this pelvis are given in pages 168—171.

Plate IV.

A view of the superior aperture of the pelvis of Martha Rhodes.

A The four lower vertebræ of the loins.
BB The right and left os ilium.
C The symphysis of the ossa pubis.
DD The tuberosities of the right and left os ischium.
EE The right and left foramen thyroideum.
FF The spinous processes of the ossa ischia.
G The distance between the sacro-vertebral angle and the inside of the symphysis pubis.

Plate V.

A view of the inferior aperture of the same pelvis.

A The uppermost part, or first bone of the os sacrum.
B The apex of the os coccygis.
C The processes of the higher lumbar vertebræ seen in perspective.
DD The outside of the right and left os ilium.
E The symphysis of the ossa pubis.
FF The tuberosities of the ossa ischia.
GG The spinous processes of the ossa ischia.

HH The foramen thyroideum on the right and left sides.

I The distance between the projection of the uppermost part of the os sacrum and the inside of the symphysis of the ossa pubis.

Plate VI.

A lateral view of the same pelvis, shewing the extraordinary projection of the spine over the cavity of the pelvis.

ABCD The four lowest lumbar vertebræ.

E The right os ilium.

F The tuberosity of the right os ischium.

G The outside of the lower part of the os sacrum.

H The os coccygis.

I The spinous process of the right os ischium.

K The right ischiatic notch.

L The right acetabulum.

M The right foramen thyroideum.

N The left foramen thyroideum, seen from the inside of the pelvis.

O The upper part of the right os pubis.

P The upper part of the left os pubis.

Q The anterior-inferior spinous process of the right os ilium.

R The same process of the left side.

S The anterior-superior spinous process of the right os ilium; that of the left side is hidden by the projection of the lumbar vertebræ.

Obs. A full description of this pelvis, which was distorted in consequence of Rachitis, is given in my Second Letter to Mr. Simmons, pages 187 &c.

TWO ADDITIONAL CORRECTIONS.

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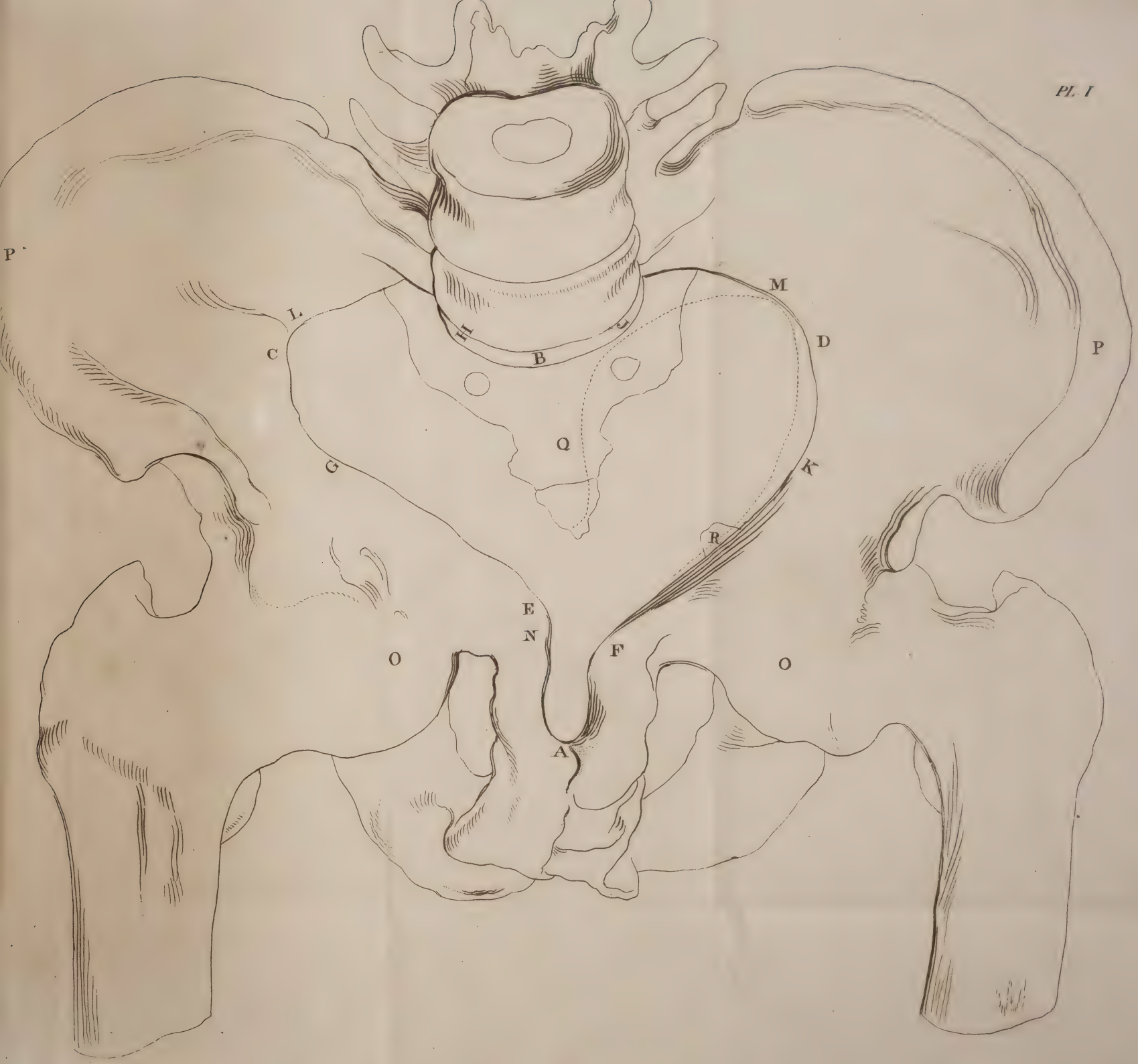
*** Dr. Hull takes this opportunity of making his best acknowledgments to those gentlemen, who have subscribed to his Epitome of the Nosologia Methodica of Sauvages, and of informing them, that, as the subscriptions are inadequate to defraying the expence of printing this work and the price of paper is so much advanced, he has, for the present at least, given up all thoughts of sending it to the press.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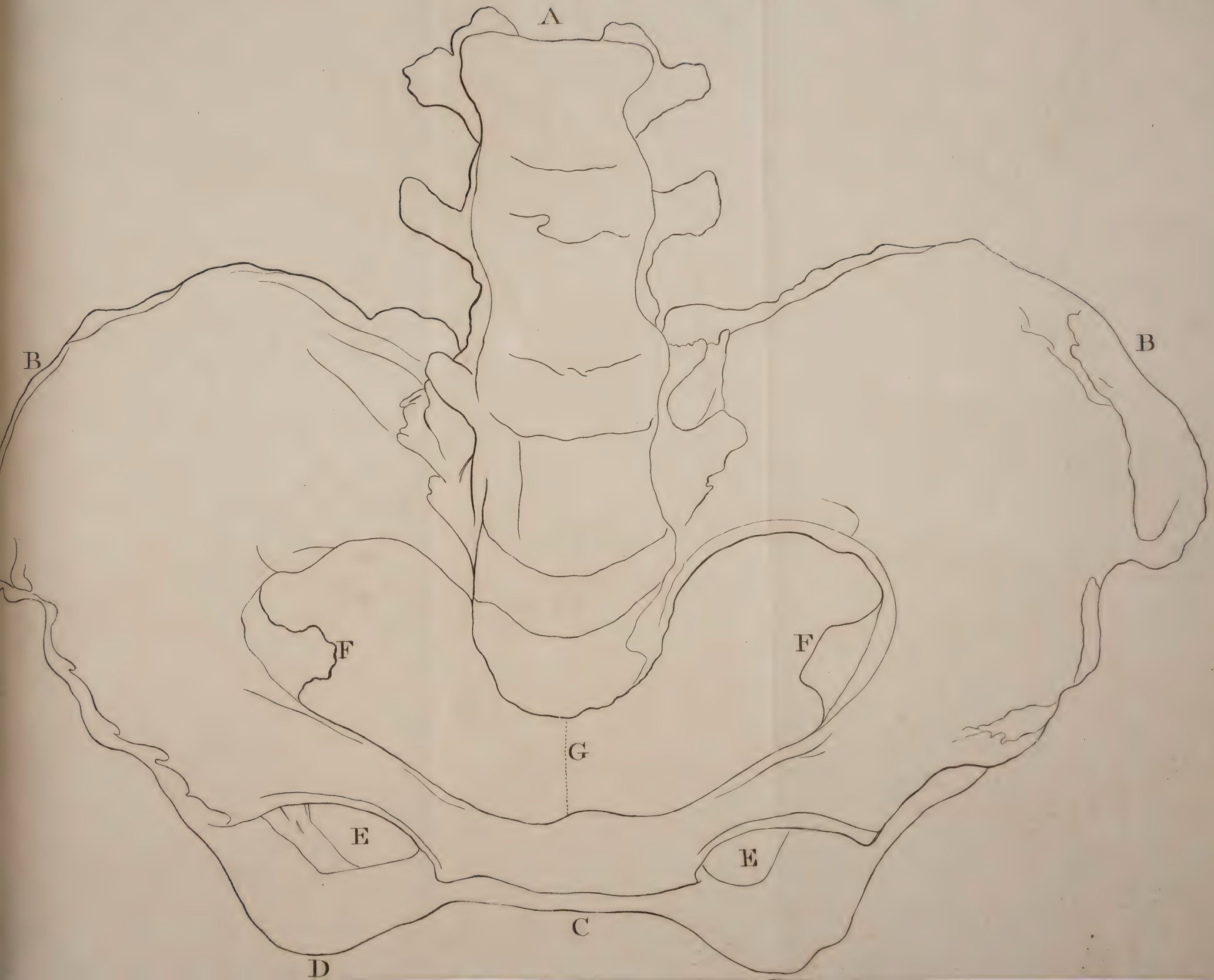
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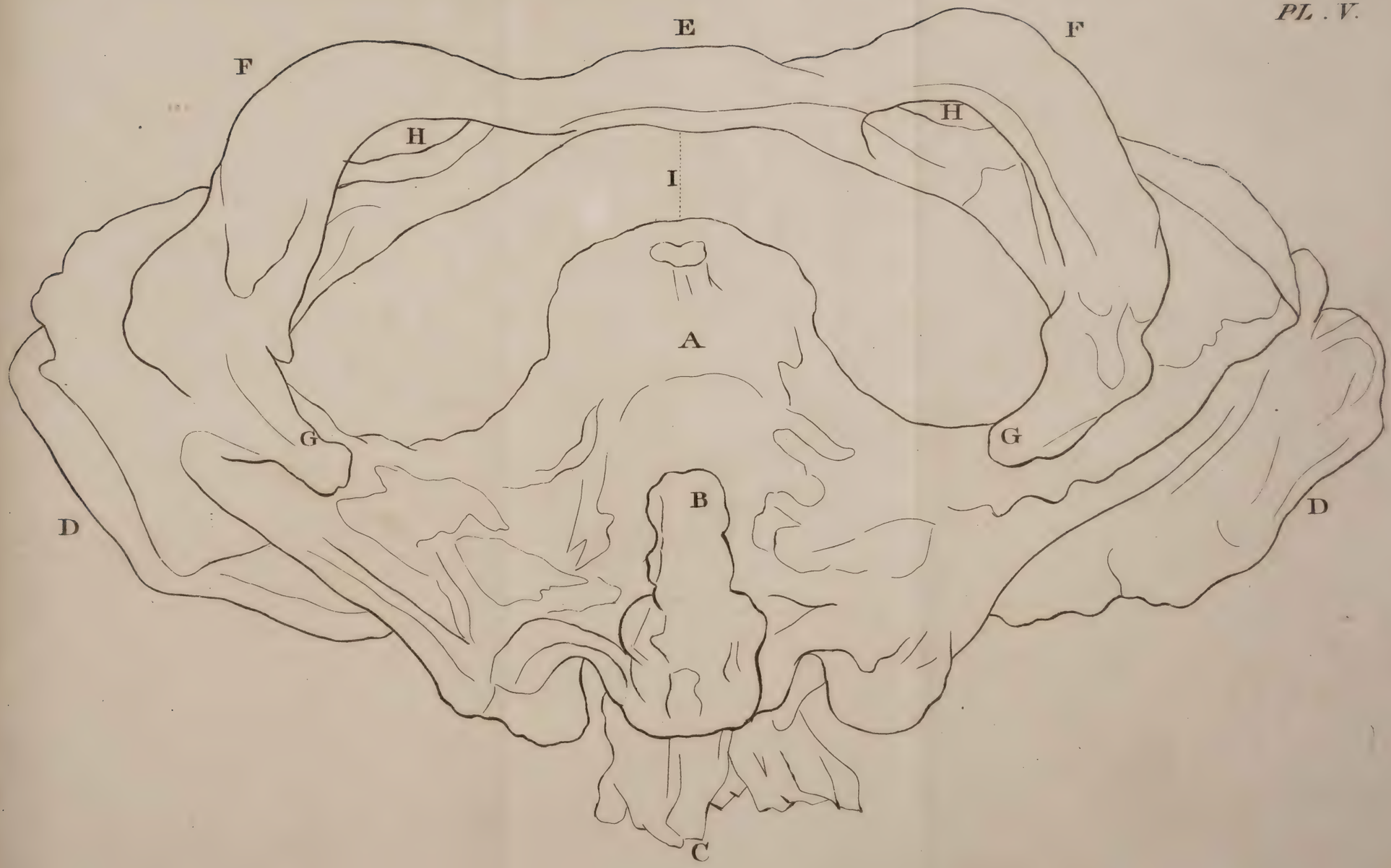
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